

Phytoconstituents and Therapeutic Importance of *Butea Monosperma* (Palash): A Review

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Abstract—

The ancient system of medicines like Ayurveda and Unani consists of a huge number of plant and their parts with various medicinal and pharmacological significance. *Butea monosperma* belonging to the family leguminaceae grows wild in several places of India. The *Butea monosperma*, it is generally known as “ Palash “. It has also known as Palas (Hindi), Mutthuga (Kannada), Bijasneha (Sanskrit), Dhak (Hindi), Khakara (Gujrat), Chichra (Hindi), Bastard Teak (English), Bengal Kino (Bangla). The *Butea monosperma* has been acknowledged in several traditional medical systems for the treatment of a variety of human ailments. The flower is used for Anti-diabetic, Anti-inflammatory, Anticonvulsant, Liver disorders, Antiestrogenic and antifertility activity, Astringent to bowel, Gout, flower juice is useful in eye diseases. Leaves are used in Appetizer, Carminative, Anthelmintic, Anti-inflammation. Bark is used in Anti-diarrheal and Wound healing properties.

Keywords: *Butea mosperma*, Palash, Chemical constituents, Curative Aspect, Formulations.

INTRODUCTION

Butea monosperma (Lam.) is a member of the Fabaceae family and is often known as Flame of the Forest [1].Palas, palash, mutthuga, bijasneha, dhak, khakara, chichra, Bastard Teak, Bengal Kino, Nourouc are some of the native names for it. It may be found in abundance on open meadows and dispersed across mixed forests. Plantations may be grown on both irrigated and non-irrigated land. Root suckers are abundant and aid in vegetative proliferation, thus the pods should be harvested and sowed before the rains begin[2] [3].Almost all components of the plant have been employed in medicine and other applications for decades. Herbal medications are becoming more popular than contemporary medicine due to its efficacy, ease of access, low cost, and lack of side effects[4]. Fish are stupefied with stem bark powder. Ropes are made from the young roots. Green leaves are a valuable source of nutrition for domesticated animals. Platters, cups, bowls, and beedi wraps are all made from leaves [5].Buffaloes and elephants consume the leaves, which are also used to make Ghongda to protect against rain. Flowers and young fruits are used as vegetables by tribals. To make a dye, flowers are boiled in water[6].It's a tall, upright tree with a crooked trunk and uneven branches, rough, ash-colored bark, and immature tomatoes. Leaves are 3-foliolate, petioles are 10-15 cm long, and the stipules are lanciolate in shape. Coriaceous leaflets (the terminal 10-20 cm long and approximately as wide, widely obovate from a cuneate base, the lateral smaller, 10-15 by 7.5-10 cm. obliquely rounded at base, inequilateral, the lower side are bigger), glabrous above when old, finely silky and noticeably reticulated veined underneath. Flowers are vivid orange red in colour, big, and in stiff racemes that are 15 cm long. The calyx is 13 mm long and dark olive green, the corolla is 3.8-5 cm long, and the stem is 2 cm tall. Night blindness, elephantiasis, anorexia, constipation, inflammation, gonorrhoea, hot urine, and other diseases are treated with various parts of this plant in traditional medicine [7].



Fig. 1. *Butea monosperma* (Lam.) Flowers



Fig. 2. *Butea monosperma* (Lam.) Leaves

BOTANICAL CLASSIFICATION

Kingdom: Plantae
 Class: Magnoliopsida
 Division: Magnoliophyta
 Order: Fabales
 Family: Fabaceae
 Genus: Butea
 Species: Monosperma

PHYTOCONSTITUENTS

Flower: Butein, Butin, Isobutrin, Coreopsin, Isocoreopsin (Butein 7-glucoside), Sulphurein, Monospermoside (butein 3--D-glucoside) and Isomonospermoside, Chalcones, Aurones, Flavonoids (Palasitrin, Prunetin), and steroids [8] [9].

Seed: It also includes seed-derived alpha amyryrin, beta sitosterol, its glucoside, and sucrose isolate. Palasonin, an antihelmintic principle, is found in it. Plasmatic, Stearic, Oleic, and Linoleic acids are found in its seeds [10].

Leaves: Glucoside, Oleic and Linoleic acid, Palmitic and Lignoceric acid, Kino-oil [11].

Bark: Pyrocatechin, Kino-tannic acid, Gallic acid Butrin, Alanind, Allophanic acid, Butolic acid, Cyanidin, Histidine, Lupenone, Lupeol, (-)-Medicarpin, Miroestrol, Palasimide, and Shellolic acid are among the Primary glycosides found in the plant [11], [12], [13], [14], [15], [16], [17], [18].

Gum: Tannins, Mucilaginous Material, Pyrocatechin [20]

Sap: Butein, Butin, colourless isomeric flavanone as well as its glucosides, Butrin, Chalcones [20]

CURATIVE ACTIVITY

Anti-hyperglycaemic activity:

In alloxan-induced diabetic Wistar rats, an ethanolic extract of *B. monosperma* flowers was found to exhibit considerable anti-diabetic effect. Daily treatment of alloxan-induced diabetic mice with a 50 percent ethanolic extract of *B. monosperma* flower petals (BMEE) for 45 days significantly reduced blood glucose levels, preventing the rapid onset of hyperglycemia seen after alloxan administration, and kept body weight and blood glucose levels close to those seen in normal control and glibenclamide-treated diabetic mice. Furthermore, blood total cholesterol, triglyceride, low-density lipoprotein, and very low-density lipoprotein cholesterol levels were all lowered, suggesting that BMEE has anti-diabetic properties [19].

Anti-inflammatory:

The anti-inflammatory efficacy of a methanolic extract of *Butea monosperma* flowers (MEBM) was investigated in albino rats with carrageenin-induced paw edoema and cotton pellet granuloma. MEBM at oral dosages of 600 mg/kg and 800 mg/kg reduced carrageenin-induced paw edoema in a dose-dependent manner. MEBM was observed to dramatically suppress granuloma tissue development in cotton pellet produced granuloma at the same dosages as control, including significant reductions in blood lysosomal enzymes (SGOT, SGPT, and ALP) and lipid peroxides [20].

Anti-diarrhoeal Activity:

In rats, the ethanolic extract derived from the stem bark of *B. monosperma* has considerable anti-diarrheal efficacy against castor oil-induced diarrhoea and PGE₂-induced enteropoolong, with additional gastrointestinal motility decrease following charcoal meal delivery. The findings support the efficacy of this herbal therapy as a non-specific diarrhoea treatment in traditional medicine [21].

Anti-convulsant activity:

Anticonvulsant action was found in ethanolic extracts of *Albizia lebeck* leaves and flowers, as well as a petroleum ether extract of *Butea monosperma* flowers. Methanolic fraction of chloroform soluble portion of ethanolic extract of *A. lebeck* leaves, acetone soluble part of ethanolic extract of *H. rosa sinesis* flowers, and acetone soluble part of petroleum ether extract of *B. monosperma* flowers all have anticonvulsant efficacy. In mice, the fractions protected them against maximal electro shock, electrical kindling, and convulsions caused by pentylenetetrazol. Convulsions generated by lithium– pilocarpine and electrical kindling were likewise suppressed by the fractions. They did not, however, protect the animals against strychnine-induced convulsions. The fractions counteracted behavioral D-amphetamine's effects while enhancing pentobarbitone-induced sleep. Gamma-aminobutyric acid (GABA) and serotonin levels in the brain were increased by the fractions. These fractions were discovered to be anxiogenic and central nervous system depressants[22].

Anti-cancer:

The aqueous extract obtained from the dried flowers of *B. monosperma* for antioxidative, anti-inflammatory, anti-proliferative, pro-apoptotic, and anticancer activities in a cancer model, where it was found to inhibit cell proliferation and accumulation of cells in G1 phase with significant induction of apoptotic cell death, implying promising anti-cancer properties. From that review *B. monosperma* show the anti-cancer activity [23].

Anti-fungal:

Medicarpin, a compound derived from petroleum and ethyl acetate extracts of *B. monosperma* stem bark, demonstrated better antifungal activity against *Cladosporium cladosporioides* than the conventional fungicide Benlate [24].

Antihelmintic effect:

Butea monosperma seeds were given as crude powder (CP) at dosages of 1, 2, and 3 g/kg to sheep spontaneously infected with mixed species of gastrointestinal nematodes, and the antihelmintic activity was dose and time dependent. On day 10, after treatment with 3 g/kg, the highest decrease in eggs per gramme of faeces (EPG) was documented at 78.4 percent. A typical

antihelmintic drug, levamisole (7.5 mg/kg), reduced EPG by 99.1 percent [25]. *B.monosperma* seed methanolic extract has significant antihelminthic action against *Caenorhabditis elegans* [26]. Pippali rasayana is an Ayurvedic herbal preparation made up of Piper longum and *B. monosperma* that is used to treat chronic diarrhoea and worm infestations. They tested Pippali rasayana for anti-giardia and immunostimulatory action in mice infected with *Giardia lamblia* trophozoites and found that up to 98 percent of the animals recovered [27].

Anti-asthmatic:

The lipopolysaccharide-induced rise in total cell count, nitratennitrite, total protein, and albumin levels in bronchoalveolar fluids in rats was decreased by the n-butanolic fraction of *Butea monosperma* [28].

Wound healing:

In experimental animals, the ethanol and aqueous extracts of *Butea monosperma* stem bark have wound-healing capabilities [29]. *Butea monosperma* stem bark flavonoid fraction demonstrated wound healing properties [30]. The ethanolic extract and acetone fraction of *Butea monosperma* stem bark demonstrated considerable wound healing activity, as evidenced by a faster rate of wound contraction, a shorter epithelialization period, and an increase in collagen deposition [31].

Osteogenic activity:

Butin, which was extracted from *Butea monosperma* seeds and given orally to adult female rats at dosages of 5, 10, and 20 mg/rat from day one to day five of pregnancy, was shown to have anti-implantation action in 40%, 70%, and 90% of the treated animals, respectively. There was a dose-dependent termination of pregnancy and a decrease in the number of implantation sites at lower dosages. The butin had estrogenic effect in ovariectomized young female rats at comparable anti-conceptive dosages, but no anti-estrogenic activity. Butin is a weak oestrogen since it has a strong uterotrophic effect even at 1/20th of the anti-conception dosage [32].

Sunscreen activity:

The created cream containing *Butea monosperma* leaves extract has the ability to protect against UVA and UVB radiation, suggesting sunscreen activity, and the formulations made by adding different concentrations of extracts may be used for different types of skin depending on the SPF value [33].

Anti-stress:

Water immersion stress caused elevations in brain serotonin and plasma corticosterone were decreased by the water-soluble component of *Butea monosperma* ethanolic extract, which was equivalent to diazepam [34].

FORMULATIONS

As Gum and Binding agent

Ibuprofen was used as a model medicine while developing the gum from *Butea monosperma* as a tablet binder. The gum was separated from *Butea monosperma* Lam's bark. Wet granulation was used to create several tablet formulations that contained the gum from *Butea monosperma*. Tablet binders with a w/v concentration of 8% produced the best results. The production of tablet dosage form was discovered to benefit from the *Butea monosperma* gum [35].

Skin protectant

Skin irritancy tests on rabbit skin and healthy volunteers were used to evaluate topical gels and creams that contained *Butea monosperma* flower and leaf extract. According to a human study, none of the volunteers' skin responded negatively to the use of cream and gel with the greatest concentration (1.5 percent). Since *Butea monosperma* formulations may be used safely as topical treatments for a variety of skin conditions or as topical cosmetics [36].

Herbal hair ointment for Alopecia

The composition for the herbal hair ointment, which includes *Butea Monosperma* and *Trigonella foenum graecum*, has hair-promoting properties. *Butea monosperma* has rich amounts of flavonoids that have the antioxidant activity and prevent hair fall, while *Trigonella foenum graecum* contains rich amounts of protein that aids in hair development [37].

CONCLUSION

Plants have been utilised to treat a range of diseases since the beginning of time. Plants or parts of plant are used as a natural drug to restore the normal physiological system has been disrupted by alien organisms or by any dysfunction of the body. The present review reveals that the plant *Butea monosperma* (Palash) is used in treating various ailments like inflammation, diarrhoea, convulsant, fungal infection, wound healing, hyperglycaemic, etc. This promising plant will require extensive study in the areas of characterisation and standardisation in order to create its many formulations, which might be useful to both people and animals.

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