

Flame of the forest a beautiful and miraculous plant

Dr. Nirbhay Singh Solanki*

*Assistant Professor (Botany) PMCoE Maharaj Bhoj Govt. P. G. College, Dhar (M.P.) INDIA

Abstract : *Butea monosperma*, commonly known as khakra, kesudi, dhak, 'Palash' and 'Flame of the Forest', is medium sized deciduous tree widely distributed in South-east Asia. This plant is also found in Dhar. It encompasses both conventional and scientific importance as it has high medicinal, religious, economical, aesthetic and ornamental values. Each part of this tree, from flowers to leaves, bark, seed, stem and gum, are of use. Palash / *Butea Monosperma* is the state flower of Jharkhand and Uttar Pradesh. Palash is considered a sacred tree and the Indian Postal Department also issued a postal stamp to celebrate the value the flower adds to the Indian landscape.

Keyword: *Butea Monosperma* , antifertility , antidiabetic activity, Apoptotic induction, Sunscreen Activity Anti-cancer activity.

Introduction - *Butea monosperma*, commonly known as the flame of the forest, palash, dhak, or tesu, is a medium-sized deciduous tree belonging to the family Fabaceae. It is renowned for its vibrant orange-red flowers that appear in the dry season, transforming the landscape into a visual spectacle. This tree is native to the Indian subcontinent and Southeast Asia, where it holds significant cultural, medicinal, and ecological importance.

Study area: Dhar is situated between 21°57' to 23°15' N and 74°37' to 75°37' E. The city is bordered in the north by Ratlam, to the east by parts of Indore, in the south by Barwani, and to the west by Jhabua and Alirajpur. The town is located 34 miles (55 km) west of Mhow. It is located 559 m (1,834 ft) above sea level.

Research Methodology: went to the forest visit and studied from time to time .more information was obtained from local people received various types of information on the internet . took many photos with mobile camera.Searched and viewed various types of research papers on the internet studied. many research papers were studied in google scholar and research journal.



Scientific Classification of *Butea Monosperma*

Kingdom Plantae – Plants
Sub-kingdom Tracheobionta – Vascular plants
Super-division Spermatophyta – Seed plants
Division Magnoliophyta – Flowering plants
Class Magnoliopsida – Dicotyledons
Subclass - Rosidae
Order Fabales
Family Fabaceae – Pea family
Genus *Butea* Roxb.ex Wild. – *Butea*
Species *Monosperma* (Lam.) Taubert – Bengal kino

Butea monosperma names in other languages:

English : Flame of the forest, Bastard teakS, Parrot Tree
Hindi : Dhak, Palas, Chichra tesu, desukajhad, chalcha, kankrei

Marathi : Palas, Kakracha

Punjabi : Tesh

Kannada : Muttagamara, Muttulu

Malayalam : Plasu Camata, Muriku, Shamata

Sanskrit : Palasah, Kimsuka, Bramha Vrksa

Assamese : Palash

Oriya : Porasu, Kijuko

Tamil : Porasum, Parasu , Camata

Telugu : Modugu Puvvu

Gujrat : Khakhrao, Kesuda

Bangal : Palas, Polashi

Urdu : Palashpapra, Dhak (Tesu)Species: *monosperma*

BOTANIC DESCRIPTION : *Butea monosperma* is a small to medium-sized deciduous tree, 5-15 (max. 20) m tall, trunk usually crooked and tortuous, with rough greyish-brown, fibrous bark showing a reddish exudate; branchlets densely pubescent.

leaves: Leaves trifoliate; petiole 7.5-20 cm long with small stipules; leaflets more or less leathery, lateral ones obliquely

ovate, terminal one rhomboidobovate, 12-27 x 10-26 cm, obtuse, rounded or emarginate at apex, rounded to cuneate at base, with 7-8 pairs of lateral veins, stipellate.

Flower: Flowers in racemes, 5-40 cm long, near the top on usually leafless branchlets; calyx with campanulate tube and 4 short lobes; corolla 5-7 cm long, standard, wings and keel recurved, all about the same length, bright orange-red, more rarely yellow, very densely pubescent.

Fruit : Fruit an indehiscent pod, (min. 9) 17-24 x (min. 3) 4-6 cm, stalked, covered with short brown hairs, pale yellowish-brown or grey when ripe, in the lower part flat, with a single seed near the apex. Seed ellipsoid, flattened, about 3 cm long.



Dr.Solanki in the forest during the survey

Butea monosperma plant



Flower



Stamp



Dhak ke teen pat



Bowl (Dona)



Macking Paniya



Dianning plate(Pattal)

Native to India,

The hindi phrase ("Dhaak ke teen paat") comes from the prominent three leaflets of this tree. It is seen in all its ugliness in December and January when most of the leaves fall: but from January to March it truly becomes a tree of flame, a riot of orange and vermillion flowers covering the entire crown. These flowers, which are scentless, are massed along the ends of the stalks—dark velvety green like the cup-shaped calices—and the brilliance of the stiff, bright flowers is shown off to perfection by this deep, contrasting colour. Each flower consists of five petals comprising one standard, two smaller wings and a very curved beak-shaped keel. It is this keel which gives it the name of Parrot Tree. In olden days, the flowers of Tesu were used to make color for the festival of Holi.

In Manipur, there is an interesting cultural use of the wood of this tree with beautiful flowers - when a member of the Meitei community dies and, for some reasons, his body cannot be found, the wood of this tree is cremated in place of the body.

Antitumor activity: The aqueous extract of flowers of *Butea monosperma* was

administered via intraperitoneal route to the X-15-myc onco mice showed antitumorigenic activity by maintaining liver architecture and nuclear morphometry but also down regulated the serum VEGF levels. Immuno-histochemical staining of liver sections with anti-ribosomal protein S27a antibody showed post-treatment termination of this proliferation marker from the tumor tissue

antidiabetic activity : The single dose treatment of ethanolic extract of *Butea monosperma* flowers at the dose of 200mg/kg P.O. significantly improved glucose tolerance and cause reduction in blood glucose level in alloxan induced diabetic Rats .

Liver disorders : An extract from the flowers of *Butea monosperma* is used in India for the treatment of liver disorders and two anti hepatotoxic flavonoids, isobutrin and butrin have been isolated from the extract . The effect of pretreatment of methanolic *Butea monosperma* extract prior to TAA treatment at two doses and the results suggest that it may contribute to the chemo preventive effect.

Butea monosperma showed a significant recovery in the level of glutathione and its metabolizing enzyme in the liver induced the detoxifying enzyme system, which is shown by the elevated levels of other QR, SOD, GPx, and xanthine oxidase, which are important phase II enzymes.

Anti-diarrhoeal activity : The anti-diarrhoeal potential of the ethanolic extract of stem bark of *B. monosperma* (Lam) has been evaluated using several experimental models in Wister albino rats. The extract inhibited castor oil induced diarrhea and PGE2 induced enteropooling in rats; it also reduced gastrointestinal motility after charcoal meal administration. The results obtained establish the efficacy and substantiate the use of this herbal remedy as a non-specific treatment for diarrhea (Gunakkunru et al., 2005).

Anti-ulcer: Methanolic extract of BM bark at 500mg/kg showed 79.30 and 82.20% healing against ethanol and aspirin induced gastric ulcerations respectively signifying free radical scavenging properties of the extract for anti-ulcer effect .

Anti-cancer activity *Butea monosperma*: Several studies have investigated the anti-cancer properties of *Butea monosperma* extracts and compounds derived from it. Here are some key findings:

1. Apoptotic induction: Apoptosis, or programmed cell death, is an important mechanism for eliminating cancerous cells. Studies have shown that *Butea monosperma* extracts can induce apoptosis in cancer cells through various pathways, including the activation of caspases, modulation of Bcl-2 family proteins, and generation of reactive oxygen species (ROS).

2. Anti-inflammatory effects: Chronic inflammation plays a significant role in the development and progression of cancer. *Butea monosperma* extracts possess anti-inflammatory properties due to the presence of flavonoids and other phytochemicals. By reducing inflammation, these extracts may help inhibit cancer growth and metastasis.

3. Anti-angiogenic activity: Angiogenesis, the formation of new blood vessels, is essential for tumor growth and metastasis. Some studies have demonstrated that *Butea monosperma* extracts can inhibit angiogenesis by targeting key angiogenic factors such as vascular endothelial growth factor (VEGF), thereby suppressing tumor vascularization and growth.

4. Cytotoxic activity: *Butea monosperma* extracts have been found to exhibit cytotoxic activity against various cancer cell lines, including breast cancer, lung cancer, prostate cancer, and leukemia cells. This cytotoxicity is attributed to the presence of bioactive compounds such as flavonoids, alkaloids, and phenolics.

5. Antioxidant effects: Oxidative stress is implicated in cancer development by promoting DNA damage and mutations. *Butea monosperma* extracts have been shown to possess anti oxidant activity, scavenging free radicals and protecting cells from oxidative damage. While these findings suggest the potential of *Butea monosperma* as a

source of anti-cancer agents, more preclinical and clinical studies are needed to evaluate its safety, efficacy, and optimal dosage for cancer treatment. Additionally, further research is required to identify and isolate the specific bioactive compounds responsible for its anti-cancer effects and to elucidate the underlying molecular mechanisms involved.

Sunscreen Activity: A concentrated cream, which has contents of BM leaves excerpts, can defend against UVA and UVB rays showing the presence of sunscreen activity. The concentration generated from the incorporation of several formulations of excerpts can be applied as per contrasting skin types according to sun protection factor value. The maximum protection shows against UVA and UVB with 1.5 % and minimum at 0.5 % formulation of cream.

Anti-fertility Activity : The hot alcoholic excerpt of Dhak seeds has been given to rats and rabbits. It shows significant antioviulatory and anti-implantation commotion. Butin was the active constituent . Methanol excerpt of Dhak stem (bark) is effective to kill sperms within 6.29 min at the concentration of 100 mg/ml, but the immobilizing activity is slow when compared to the spermicidal agent which shows complete immobilisation within 20 sec at 2 % concentration. Three-minute exposure of petroleum ether and chloroform excerpt of Dhak root showed complete immobilisation of sperm at the doses of 15mg mL⁻¹ without any changes as compared to the control group show curling in the hypo-osmotic swelling test. Sperm activity declines in a dose-dependent manner.

Anthelmintic: The seeds and bark exhibit significant anthelmintic activity, validating their use in treating intestinal worm infections.

Anti-asthmatic: n-butanolic fraction of *Butea monosperma* inhibited the lipopolysaccharide induced increase in total cell count, nitrate/nitrite, total protein and albumin levels in bronchoalveolar fluids in rats (Shirole et al., 2013).

Other uses and information:

1. Tesu flowers are used to make natural colour during the festival of Holi.
2. The flowers are the perfect way to control and manage indoor pollutants.
3. In tribal areas, women use the flowers to adorn themselves.
4. Palash flowers are believed to have religious value and are used in havan or yagna ceremonies.
5. Palash is considered a sacred tree and the Indian Postal Department also issued a postal stamp to celebrate the value the flower adds to the Indian landscape.
6. Palash / *Butea Monosperma* is the state flower of Jharkhand and Uttar Pradesh.
7. It is also believed that palash is the form of the God of life himself- Agni.
8. Each part of this tree, from flowers to leaves, bark, seed, stem and gum, are of use. The tree has been

used extensively in alternative medicines such as Unani, Homeopathy and Ayurveda medicines for its analgesic, aphrodisiac and antifertility properties.

9. Palash bark is applied externally to treat wounds and cuts.
10. Palash seeds are often used to treat worm infestation. The seeds are also laxative in nature.
11. The gum can be used to treat dysentery and diarrhoea.
12. Dried flowers are used as colour and in bathing to cure skin rashes and infection in summers. The flowers are rich in sulphur, which makes them a perfect treatment for skin ailments. The flowers purify and cleanse the bloodstream of free radicals. The paste of flowers is also applied externally to cure joint pains, swelling, sprains, injury and arthritis. The bark of the tree also has blood purifying properties.
13. Fruits and seeds of the plant are used to treat skin ulcers, piles and disorders related to eyes such as cataract.
14. Roots of a palash tree are used as an analgesic. They are also used to cure night blindness.
15. The twing of palash plant is used as a tooth brush.
16. Fresh leaves are used for making dinning plates and bowls.
17. Fiber: Bark fibers are obtained from stem for making cordage .
18. Fish-Poison: Stem bark powder is used to stupefy fishes .
19. Fodder: Green leaves are good fodder for domestic animals .
20. Domestic utensil: Fresh leaves are used for making dinning plates and bowls .
21. Vegetables: Flowers and young fruit are used as vegetables by tribals .
22. Dye: Flowers are boiled in water and cooked to obtain a dye.
23. Dal Paniya' is very famous dish, usually made during festivals and on auspicious occasions. Paniya is a bread prepared from corn flour and is roasted after sandwiching it between the leaves of Palash tree.
24. in the rural areas brushes are made by crushing the stem of the palash plant and it is used to paint the walls with lime.
25. The gum found in small, brittle glistening pieces, reddish-black in color. Is odorless with a very astringent taste sticking to teeth when chewed making the saliva bright red. It is almost entirely soluble in alcohol and entirely soluble in ether and partly in water.
26. Orally it is used in diarrhoea, dysentery, and as gargle in throat infection.
27. Locally called Kamarkas meaning thereby fortification of back muscles, the gum is used to strengthen these muscles that are delicate and more elastic. Since females usually experience tiredness and back-ache during menstruation, pregnancy and post delivery, the

gum taken orally acts as tonic to pelvic and back muscles, in these conditions. It is used by almost all females in India to recover from problems of weakness, supple delicate muscles and loose skins, and to reshape the body after delivery and to get rid of menstrual problems.

Conclusion: This plant is very important. It is of great medicinal importance. Blooming of flowers in the month of spring. The whole forest looks so beautiful. This provides honey for lots of bees. This plant also provides wood for cooking food to people living in rural areas.

This is a plant of great medicinal importance. This plant shows antitumor activity, antidiabetic activities, antidiarrhea activities, antiulcer activities, anticancer activities, antifertility activities.

It prevents soil erosion. Provides nesting sites for birds. This is a very important plant to make mother earth beautiful. Let's come together and protect this plant.

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References:-

1. <https://prebooks.in/shop/35-india-flame-of-the-forest-used-stamp/>
2. <https://www.mapsofindia.com/maps/madhyapradesh/roads/dhar.htm>
3. <https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280658>
4. <https://www.indraprasthahorticulturesociety.com/tesu-flowers-butea-monosperma-and-their-uses/>
5. [https://en.wikipedia.org/wiki/Dhar#:~:text=Dhar%20is%20situated%20between%2021,1%2C834%20ft\)%20above%20sea%20level.](https://en.wikipedia.org/wiki/Dhar#:~:text=Dhar%20is%20situated%20between%2021,1%2C834%20ft)%20above%20sea%20level.)
6. <https://www.flowersofindia.net/catalog/slides/Flame%20of%20the%20Forest.html>
7. <https://jhabua.nic.in/en/tourism/>
8. https://apps.worldagroforestry.org/treedb/AFTPDFS/Butea_monosperma.PDF
9. More, B. H., Sakharwade, S. N., Tembhurne, S. V., & Sakarkar, D. M. (2012). Ethnobotany and Ethanopharmacology of Butea Monosperma (Lam) Kuntze-A Compressive Review. *Am J PharmTech Res*, 2(5), 138-159.
10. More, S., Jadhav, V. M., & Kadam, V. J. (2018). A comprehensive review on Butea monosperma: A valuable traditional plant. *International Journal of Botany Studies*, 3(1), 65-71.
11. Sutariya, B. K., & Saraf, M. N. (2015). A comprehensive review on pharmacological profile of Butea monosperma (Lam.) Taub. *Journal of Applied Pharmaceutical Science*, 5(9), 159-166.
12. Punjani Bhaskar L 1998. Plants used as tooth brush by tribes of District Sabarkantha (North Gujarat). *Ethnobotany*. 10: 133-135.
13. The wealth of India: A dictionary of Indian Raw mate-

- rial and Industrial product-Raw material Series, Volume-I-XI (Publication and Information Directorate, CSIR, New Delhi, India), 1948; 251-252.
14. Jain SK. Dictionary of Indian Folk Medicine and Ethnobotany, Deep Publication, New Delhi, India, 1991.
 15. Bhattacharjee SK, Handbook of Medicinal Plants. Pointer Publishers, Jaipur, India, 1995.
 16. Punjani, B. L. (1998). Plants used as toothbrush by tribes of district Sabarkantha (North Gujarat). *Ethnobotany*, 10, 133-135.
 17. Somani, R., Kasture, S., & Singhai, A. K. (2006). Antidiabetic potential of *Butea monosperma* in rats. *Fitoterapia*, 77(2), 86-90.
 18. Sehrawat, A., Khan, T. H., Prasad, L., & Sultana, S. (2006). *Butea monosperma* and chemomodulation: protective role against thioacetamide-mediated hepatic alterations in Wistar rats. *Phytomedicine*, 13(3), 157-163.
 19. Wagner, H., Geyer, B., Fiebig, M., Kiso, Y., & Hikino, H. (1986). Isoputrin and butrin, the antihepatotoxic principles of *Butea monosperma* flowers¹. *Planta medica*, 52(02), 77-79.
 20. Punjani Bhaskar L 1998. Plants used as tooth brush by tribes of District Sabarkantha (North Gujarat). *Ethnobotany*. 10: 133-135.
 21. Sindhia, V. R., & Bairwa, R. (2010). Plant review: *Butea monosperma*. *International journal of pharmaceutical and clinical research*, 2(2), 90-94.
 22. Gunakkunru, A., Padmanaban, K., Thirumal, P., Pritila, J., Parimala, G., Vengatesan, N., & Pillai, K. K. (2005). Anti-diarrhoeal activity of *Butea monosperma* in experimental animals. *Journal of ethnopharmacology*, 98(3), 241-244.
 23. Akram, M., Akhtar, N., Asif, H. M., Shah, P. A., Saeed, T., Mahmood, A., & Malik, N. S. (2011). *Butea monosperma* Lam.: A review. *J. Med. Plants Res*, 5, 3994-3996.
 24. Neupane, A., & Aryal, P. (2022). Medicinal Values of *Butea monosperma*: A. *Asian Journal of Pharmacognosy*, 6(2), 6-13.
 25. Kumar, A., Gupta, M., Singh, S., Goel, N., Tiwari, P. S., & Gupta, S. P. (2023). A SYSTEMIC REVIEW ON PALASH (*BUTEA MONOSPERMA*). *Journal of primary healthcare*, 9(2), 871-899.
 26. Surin, W. R., & Ananthaswamy, K. (2011). Recent advances on the pharmacological profile of *Butea monosperma*. *GERF Bull Biosci*, 2(1), 33-40.
 27. Pooja singh ,vasusingh,R.C. Tiwari and deeptinegiwpls 2023. AREVIEW ON BRAMHA VRIKSHA: PLASH (*BUTEA MONOSPERMA*) vol (9) issue (4),100
 28. Ambastha, S., & Sharan, L. (2023). Review on Medicinal Importance of *Butea monosperma* Lam.(Taub). *Defense Life Science Journal*, 8(1), 83-92.
 29. Dharti Methaniya, Riddhi Rathore, Hitesh Solanki, IABCD,2023, VOL(2), ISSUE(1),227
 30. Tiwari, P., Jena, S., & Sahu, P. K. (2019). *Butea monosperma*: phytochemistry and pharmacology. *Acta Scietific Pharmaceutical Science*, 3(4), 19-26.
 31. Aditya Gupta, Shubham Singh, Khushboo Gaur, Abhishek Singh, Lalit Kumar, IJRAP8(2) 2017, 197
 32. Somayaji, A., & Hegde, K. (2016). A review on pharmacological profile of *Butea monosperma*. *International Journal of Phytopharmacology*, 7(4), 237-249.
 33. Kiruba, M. 2024. *Butea monosperma* - Botanical, Pharmacological, and Conservation: An Overview. *Vigyan Varta* 5(8): 197-202.
 34. More, B. H., Sakharwade, S. N., Tembhurne, S. V., & Sakarkar, D. M. (2013). Evaluation of Sunscreen activity of Cream containing Leaves Extract of *Butea monosperma* for Topical application. *International Journal of Research in Cosmetic Science*, 3(1), 1-6.
 35. Bhargava, S. K. (1986). Estrogenic and postcoital anticonceptive activity in rats of butin isolated from *Butea monosperma* seed. *Journal of ethnopharmacology*, 18(1), 95-101.
 36. Udiwal, S., Jain, N. K., Gupta, M. K., & Goyal, S. (2014). Anti-fertility activity of *Butea Monosperma* Linn in albino rats. *Curr Res Biol Pharm Sci*, 3(4), 6-11.
 37. Neeru Vasudeva, N. V., Geeta Rai, G. R., & Sharma, S. K. (2011). Anti-spermatogenic activity of *Butea monosperma* (Lam.) Kuntze root Asian J. Biolo. Sci. 4(8), 591-600.
 38. Shirole, R. L., Kshatriya, A. A., Sutariya, B. K., & Saraf, M. N. (2013). Mechanistic evaluation of *Butea monosperma* using in vitro and in vivo murine models of bronchial asthma.
 39. Jain, A., Dubey, S., Sahu, J., Gupta, A., Tyagi, A. K., & Kaushik, A. (2010). *Butea monosperma*: The Palash-A Versatile Tree Full of Virtues. *Research Journal of Pharmacognosy and Phytochemistry*, 2(1), 7-11.
