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A brief review on: Butea *monosperma*

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Abstract:

The 17% of rural population were depending on traditional based components and were using for various treatment of disorders. In present scenario the synthetic analogues leads abundant, drastic tragedies exhibits who are consuming the analogues, especially chemotherapeutic analogues over elicits more severe adverse effects rather than clinical value. The developed countries like Japan so far not depending on allopathic medicine because of genomic alterations and leads defect on immunity. By considering all these facts we decided that, bio analogues are excellent, safe, economically cheap and comfortable for human kinds hence the present study is focused on a brief review on *butea monosperma.*

Key words:

Butea monosperma, Antioxidant, DPPH, Antimicrobial.

Introduction:

Butea monosperma (Lam.) Kuntze, also known as 'dhak' or 'palas,' or flame of the forest, is a moderately large deciduous tree that is extensively dispersed in India, Burma, and Ceylon. It is widely accessible in Indian markets. It is a member of the Fabaceae family. There are 18,000 species in the 630 genera that make up the Fabaceae family [1].

Most plant components have historically been used medicinally to treat a variety of illnesses. The tree grows slowly. According to reports, bark has aphrodisiac, astringent, bitter, pungent, alliterative, and anti-obese properties. Roots can treat elephantiasis, as well as night blindness and other vision problems. The qualities of leaves include astringency, tonicity, diuretic, antidiabetic, antidiarrheal, and antimicrobial effects. Hepatoprotective, anti-inflammatory, and anticonvulsant activities are said to exist in flowers [2].

The following parts of plants may be used such as flower, gum, seed, leaf and bark [3].

This medium-sized tree has enormous tree 3-foliate leaves and twisted branches. Large flowers, scarlet-red blossoms with an orange hue. Flat, one-seeded pods that resemble leaves [4].

Leaves

monosperma's leaves are beneficial for the eyes. The chewable, soaking liquid that comes out acts as an astringent and appetizer and aids in the treatment of cough, cold, and stomach issues. Additionally, it aids in the management of diabetes. For the treatment of sore throat issues, you might gargle or frequently puff your mouth. It facilitates ladies' menstrual periods [5].

Flowers

The primary usage of flowers is to treat digestive issues, stomach aches, and other conditions related to the stomach. It also treats other conditions like leprosy, sanguinary, skin issues, and thirst.

Juice mixtures are now frequently used to treat eye infections. The astringent properties of flowers are used as an emulsifier and as expectorants. Regular juice consumption aids in the management of the "gonorrhea" infection. When the flower's derived dye is consumed, the spleen grows more quickly and healthily. They play a significant part in the pain associated with inflammation. It improves the flow of the menstrual cycle for women, and it has recently been discovered to be helpful for pregnant women with diarrhea. When it comes to men, it aids in genital health [5].

Seeds

The finely powdered form of seed is mostly used to cure intestinal worms in youngsters and build an army to combat them. Approximately 4 teaspoons of seeds are taken on a regular basis to cure urinal issues as well as to avoid and get rid of adult kidney stones. The seeds are easily absorbed when fully mixed with a lemon-honey mixture before being consumed [5].

Roots

The roots are useful for treating elephantiasis and other eye abnormalities as well as night blindness.

Additionally, heated root pieces should be consumed regularly for at least one month every evening for treating impotence. A snake bite antidote is also made from a blend of root [5].

Gum

Gum works best as a crack-prevention measure for the sole of the foot [5].

In addition, it is used to treat dysentery, particularly in children. It has bowel-astringent properties [5].

Stem bark

Stem bark is used to cure any infection that develops as a result of any damage. The stem juice is also used to treat thyroid hormone insufficiency. The semi-solid stem bark paste is applied to any inflammation to treat it. The bark's flavor is bitter, slightly acidic, and functions as an appetizer, aphrodisiac, laxative, and in some cases, a treatment for fractures. Regular use of bark paste is used to cure liver disorders, gonorrhea, and it also purifies blood. Also, an effective treatment for scorpion stings [5].

Indigenous names in India

SANSKRIT: Palasa

HINDI: Dhak, palas

ENGLISH: Bastard Teak

BENGAL: Mal & Mar

GUJARATI: Khakharo

MARATHI: Kakracha

TELUGU: Mooduga, palasamu

TAMIL: Parasa

KANNADA: Muttuga

MALYALAM: Brahmavriksham, kimshukam [6]

Morphology

It is an upright, 12- to 15-meter-tall tree with a crooked trunk and uneven branches. Silky pubescence in shades of grey or brown covers the shoots. Ash-colored bark can be seen. The three foliate, big, and stipulate leaves. Petiole length is 10 to 15 cm.

The bases of the leaflets are connate or deltoid, and they are obtuse, glabrous above, delicately silky, and prominently reticulately veined beneath.

Anthers are uniform, while stamens are didelphis. The ovary has two ovules, a capitate stigma, and a filiform, curving style [7].

Pods are argenteocanesent, slender, and thickened at the sutures. They divide around a single apical seed and are indehiscent at the base. The seeds are reniform, flat, and curled.
On bare branches, flowers grow in 15 cm long, stiff racemes that are heavily covered in brown velvet [7].

Calyx has a rich exterior covering of velVet and is dark, olive green tobrown in hue.
The corolla is lengthy and has bright orange red and silky silvery hairs on the outsid the bole is gnarled and twisted, and the branching is also disorganized. It matures at around 50 years old and grows slowly, reaching a height of around 5 to 8 m and a diameter of about 20 to 40 cm [7].

By December, the leaves are lost, and they come back in the spring. The tree produces bright orange to red flowers when it is leafless. These blooms begin to bloom in February and continue for almost the entire month of April. The diameter ranges from about 2 to 4 cm. The bottom whorl of the flower, or the calyx, is often gloomy grey in color, much like the supporting branch. The top portion is brick red.

The palas fruit is a flat legume in the shape of a pod that is roughly 15 cm long and 3 to 5 cm wide. Young pods have a velvety covering and a lot of hair.

When ripe, the pods droop like strange legumes [7].

The flat, 15 to 25 mm wide, 1.5 to 2 mm thick seeds range in size from 25 to 40 mm. The two large, leafy, yellowish cotyledons are enclosed by a reddish-brown, glossy, and wrinkled seed coat. The hilum is prominent and is located close to the center of the seed's concave edge.

The flavor is mildly acidic and harsh, and the aroma is weak. The colour of the wood is a greenish white. It contains annual rings, albeit they are not particularly prominent, and is porous and soft in texture. When utilised in locations subject to weather changes, it often deteriorates quickly; however, when used underwater, it lasts much longer. As a result, it is employed in the construction of curbs and piles [7].

Fig 1: B. *monosperma* flower

Fig 2: B. *monosperma* leaves

Fig 3: B.*monosperma* tree

Chemical constituents:

Flowers

Butrin (1.5%), butein (0.37%), and Butin (0.04%) are the principal phytoconstituents of B. monosperma (flowers) [Lavhale and Mishra, 2007]. Other phytoconstituents found in the flower include triterpene, isobutrin, coreopsin, isocoreopsin (butin 7- glucoside), sulphurein, monospermoside (butein 3-e-D-glucoside), isomonospermoside, chalcones, aurones, flavonoids palasitrin and prunetin, and steroids [8].

Seven flavones and flavonoid components, including butrin and isobutrin, as well as four free amino acids were detected in dried flowers of the related species B. frondosa by phytochemical screening (Gupta et al., 1970; Singh et al., 1974). The three glucosides known as coreopsin, isocoreopsin, and sulphurein were studied by Gupta et al. in 1970.

The final two, which are brand-new, have been given the names monospermoside and isomonospermoside [Gupta et al., 1970]. From the petroleum ether extract of flowers, Shah et al. (1992) extracted and distinguished free sugars and free amino acids [Shah et al., 1992] [8].

Seeds

Oil, proteolytic and lypolytic enzymes, plant proteinase and polypeptidase, a nitrogenous acidic substance, and palasonin are all found in B. monosperma seeds. Additionally, it contains somonospermoside and monospermoside (butein 3-e-D-glucoside). Allophonic acid has been discovered and isolated from seed coats [Jawaharlal et al., 1978; Rastogi and Mehrotra, 1979]. Components of soft resin were reported by Singh et al. in 1974. The majority of soft resin is made up of four practically pure acid esters that were discovered [8]..

Leaves

Glucoside, Kino-oil contain oleic and linoleic acid, palmitic and lignoceric acid [Nadkarni, 2002l]. Mishra et al. (2000) reported 3,9-dimethoxypterocapan from ethyl acetate fraction of methanol extractives from leaves and hexane fraction of methanol extractives yielded 3- alphahydroxyeuph- 25- nylheptacosanoate.[Mishra et al., 2000] [8].

Bark

include gallic acid, pyrocatechin, and kino-tannic acid [Nadkarni, 2002]. Palasitrin and major glycosides such as butrin, alanind, allophanic acid, butolic acid, cyanidin, histidine, lupenone, lupeol, (-)- medicarpin, miroestrol, palasimide, and shellolic acid are also present in the plant [Mishra et al., 2000; Schoeller et al., 1938] [8].

Stems

From B. monosperma, Guha et al. (1990) extracted 3-Z-hydroxyeuph-25-ene and 2,14-dihydroxy-11,12-dimethyl-8- oxo-octadec-11-enylcyclohexane. Stigmasterol-e-Dglucopyranoside and nonacosanoic acid were identified by Shukla et al. in 2000 [Shukla et al., 2000] [8].

Pharmacological activities

Anti-conceptive activity

From day 1 to day 5 of pregnancy, adult female rats were given oral doses of Butin, an extract from Butea monosperma seeds, at 5, 10, and 20 mg/rat. From these doses, 40%, 70%, and 90% of the treated animals had anti-implantation activity. Reduced implantation sites and a dose-dependent termination of pregnancy were observed at lower dosages. The Butin showed estrogenic action in young female rats with ovariectomies at doses that were comparable to anticonception doses, but it had no anti-estrogenic effects. Butin is a weak estrogen since even at a dose that is a twentieth of the anticonception dose, a substantial uterotrophic impact may be seen. The use of seed oil as a traditional sexual toner and contraception has been recorded [9].

Anthelmintic activity

Sheep naturally infected with mixed types of bacteria were given doses of 1, 2, and 3 g/kg of butea monosperma seeds as crude powder (cp). The anthelmintic action of gastrointestinal nematodes was dose- and time-dependent. the greatest reduction of 78.4% was observed in eggs per gramme of feces (epg). on day 10 following administration of 3 g/kg levamisole (7.5), mg/kg), a common anthelmintic medication, demonstrated99.1% less of the anthelmintic action of epg. Numerous kinds of butea have been recorded to harm people. Earthworms, Ascaris lumbricoides, Ascaridia galli oxyurids, Dipylidium caninum, toxocarid Canis, and Taenia (20), a butea monosperma methanol extract seeds had strong in vitro anthelmintic action [9].

Anticonvulsant activity

TBM is the name of a triterpene discovered in Palash. It is what causes the anticonvulsive effect, but additional research is needed. not yet necessary in this regard. The anticonvulsant is shown by TBM. prevention of MES-induced seizures (Maximum Electro Pilocarpine nitrate, lithium sulphate, shock, electrical death, Pentylenetetrazol (PTZ), too. Also, it exhibits depressive effects on the Central Nervous System (CNS) with cumulative usage of 7 days long. Similar to how, after frequently utilizing the TBM, the pentobarbital-induced sleep's length did not shorten [9].

Antidiabetic activity

In the Alloxan-induced diabetic rats, the ethanolic Palash extract lowers blood glucose levels. Blood was drawn repeatedly after 14 days of oral treatment with this herbal medicine. glucose levels drop, serum cholesterol levels drop, and HDL (High Density Lipoprotein) cholesterol levels were enhanced. noted as comparison to the diabetic control group. Extract of ethanol antidiabetic, hypolipidemic, and antiperoxidative effects effects in

rats with type 2 diabetes. This's aqueous extract medication lowers blood sugar levels in both healthand At 2 andhours,alloxaninduceddiabeticmice,respectively.The hypoglycemic effect, however, peaks around 90 minutes. This is not as long-lasting as that observed with the medication metformin [9].

Antistress activity

The water-soluble portion of Butea monosperma's ethanolic extract was discovered to be helpful in lowering the elevated concentration of serotonin and plasma corticosteroids caused by stress from water immersion [9].

Anti Implantation activity

Separated butin from Palash flowers exhibits both male and female contraceptive action. Female rats were given the butin, which was extracted from the seeds of the Palash plant (Butea monosperma), at doses of 5, 10, and 20 mg/rat from the first to the fifth day of pregnancy, and it showed anti-implantation activity in 40%, 70%, and 90% of the treated animals, respectively.

Palash's alcoholic extract has been discovered to have antifertility properties. Butin is a weak estrogen since even at a dose that is a twentieth of the contraceptive dose, a sufficient uterotrophic impact could be shown [6].

Anti Inflammatory activity

The anti-inflammatory effects of Butea monosperma methanolic extract were investigated in albino rats that had developed cotton pellet- and carrageenan-induced granulomas and rat paw inflammation. That extract yielded the discovery of the agent MEBM. Taking MEBM orally at doses of 600 mg/kg and 800 mg/kg prevented the paw edoema that carrageenan causes. When cotton pellets were used to induce granuloma, MEBM was likewise found to be effective at reducing the formation of granuloma tissue at the same doses. In comparison to control groups, it also decreased serum lysosomal enzymes and lipid peroxides [9].

Antifungal activity

Cladosporium cladosporioide is resistant to the antifungal action of Palash's petroleum and ethyl acetate extracts. Medicarpin, a chemical component, was in charge of this antifungal activity. It was discovered to have higher antifungal activity than the common fungicide, Benlate [6].

Anti – diarrheal activity

Butea monosperma (Lam) Kuntz stem bark ethanolic extract at 400 mg/kg and 800 mg/kg inhibited Castor oil impaired gastrointestinal motility following charcoal meal delivery in Wistar albino rats and caused diarrhoea via decreasing gastrointestinal motility and PGE 2-induced enteropooling . In cases of persistent diarrhoea, butea monosperma gum has also been found to be beneficial. It has strong astringent properties and lowers bilirubin levels [6].

Antiesterogenic and antifertility activity

The uterotropic and uterine peroxidase activity of ovariectomized rats were affected by Butea monosperma methanolic extracts, and the estrogenic/antiestrogenic potential of antifertility drugs was assessed using the rat uterine peroxidase test. The title plant's blooms have been reported to have antiestrogenic and antifertility properties when extracted with alcohol. Male and female contraceptive qualities can be seen in butin when it is separated from the plant's flowers [9].

Medicinal uses

Leaves. The impact of leaves on stress, anxiety, and cognition in rats was examined by Soman et al. in 2004. Butea frondosa leaves have been shown to have anti-inflammatory properties by Mengi and Deshpande (1999) [10].

Roots. Roots' in vitro lens-protective and antibacterial action was reported by Bodakhe and Ahuja (2004) [10].

Stems. Savitri et al. (1989) revealed the presence of antifungal components in stem bark extracts made with petroleum and ethyl acetate. The extract significantly inhibited the growth of C. cladosporiodes. Castor oil-induced diarrhoea model and PGE2-induced enteropooling in rats were used to assess the potential antidiarrheal properties of ethanolic extract. Additionally, after ingesting a meal containing charcoal, extracts decreased gastrointestinal motility. The impact of alcoholic bark extract on cutaneous wound healing in rats was examined by Suguna et al. in 2005. In order to treat giardiasis, Agarwal (1976) reported using "Ayurvedic Rasayana" (herbal medicine) containing Butea monosperma. This treatment may have involved immunomodulation because the Rasayana failed to kill the parasite in vitro [10].

Flowers. The anticonvulsant effects of Butea monosperma flowers were examined in laboratory animals by Kasture et al. in 2002. Mishra and Lavhale and Misra (2007) reported free radical scavenging activity of various extracts of flower by using different in vitro models like reducing power assay, scavenging of 2,2 diphenyl-1-picrylhydrazyl (DPPH) radical, nitric oxide radical, super oxide anion radical, hydroxyl radical and inhibition of erythrocytes hemolysis by using 2,2 azo-bis (amidinopropane) dihydrochloride (AAPH). The ethyl acetate and butanol fractions of methanolic extract demonstrated strong free radical scavenging activity. The extracts' greater phenolic levels could be the cause of the activity that was observed. Kasture et al. (2002) examined the anticonvulsant and antistress effects of flowers. The ethanolic extract's water-soluble component reduced the stress-related rise of brain serotonin and plasma corticosterone brought on by water immersion. Additionally, in a dose-dependent manner, the ulcer index decreased. The triterpene in the petroleum ether extract's n-hexane: ethyl acetate (1:1) fraction was discovered to be the anticonvulsant active ingredient. Triterpene demonstrated anticonvulsant effectiveness against seizures brought on by lithium and pilocarpine, pentylenetetrazol, electrical kindling, and maximum electroshock (MES). To find out if it can be used to treat epilepsy, more research is needed. According to Kasture et al. (2000), the effects of flowers on behaviour and memory are mediated by monoamine neurotransmitters. The elevated plus maze paradigm and active avoidance learning showed nootropic action in the petroleum ether and ethanolic extract, respectively. Isobutrin and butrin were identified by Wagner et al. (1986) as the antihepatotoxic components of flowers. Two well-known flavonoids, isobutrin and the less potent butrin, made up the antihepatotoxic components that were extracted. In the ethyl acetate fraction of the methanolic extract, flavonoids were found, according to Mishra et al. (2000; 2007). Flowers were found to have antiestrogenic activity and phytochemical research, according to Shah et al. (1990; 1992). Alcoholic extract has strong antiestrogenic properties, whereas ethyl acetate extract with butrin and isobutrin has weak properties [10].

Seeds. The methanol extract of seeds has been shown to have in-vitro anthelmintic activity by Zafar et al. (2006) and Prashant et al. Butea monosperma's effects on hyperlipidemia and hyperglycemia were examined by Bavarva and Narasimhacharya (2008) in NIDDM mice. Bhargava (1986) reported that butin, a substance derived from Butea monosperma seeds, had estrogenic and postcoital anticonception effects in rats. According to Pandey (2001), seed oil has been used for centuries as a natural contraceptive and sexual toner [10].

Conclusion:

The area covered in the studied can be used and analysed in identification and screening of *Butea monosperma* in the initial crude drug form and can be used as a potential source for useful therapeutics and treatments. The resulted data will be beneficial for quantitative and qualitative standardization of genuine drug in herbal preparations. Substantiate result for alkaloids, saponins and phenol is indicative of scope for future analysis. Herbs are the natural drugs used to regain the alterations made in normal physiological system by foreign made in normal physiological system by foreign medicinal plants and to know their potential for the advance of health and hygiene through an ecofriendly system. Thus, importance should be given to the potentiality of ethnomedicinal studies as these can provide a very effective strategy for the discovery of medicinally active identity. The present review reveals that the plant Butea monosperma is used for treating various ailments. The tree is of immense medicinal value.

The root traditionally used as prophylactic agent, cures nyctalopia and other defects of sight; useful in elephanthiasis.

It elicits on all aspects of the herb and throws the attention to line the mind of the researchers to carry out the work for developing its varied formulations, which can ultimately be beneficial for the human beings as well as animals.

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