

***Butea monosperma* (PALASH): Plant Review with Their Phytoconstituents and Pharmacological applications.**

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Abstract: *Butea monosperma* belongs to the plant family Fabaceae and the order Fabales. This herb is commonly known as Palas in Hindi. It is also called “the flame of the forest” due to the bright orange and scarlet colors of its flowers. It follows the trade name “Butea” which has been taken from its scientific name *Butea monosperma*. *Butea monosperma* is a species of *Butea* native to tropical and subtropical part of India, Subcontinent and Southeast Asia, ranging across India, Sri Lanka, Bangladesh, Nepal, Myanmar, Thailand, Laos, Cambodia etc. The plant is highly used by the rural and tribal people in curing various disorders. Flowers are used as drug in many ailments like eye disease, chronic fever, enlargement of spleen, leucorrhoea, epilepsy, leprosy, anti fungal activity, anti-inflammatory activity, liver disorders antifertility activity and gout etc. The plant parts are used in the form of extract, juice, infusion, powder and gum. It contains butrin, iso-butrin, triterene, coreserpine, iso-coreserpine, isomonospermoside, chalcones, aurones, flavonoid (palasitrin, prunetin) and steroids are other phytoconstituents present in the flower. Seed of *B. monosperma* contains oil, proteolytic and lypolytic enzymes, plant proteinase and polypeptidase, a nitrogenous acidic compound, along with palasonin. The present review article summarizes various pharmacognostic and pharmacological aspects of the plant.

Key Word: *Butea monosperma*, proteolytic and lypolytic enzymes, gout, anti-inflammatory, epilepsy, leprosy, anti fungal, fever. etc.

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I. Introduction

India now is one of the major developing country in the world and also suffering from over population and which turns out to be the major problem and not just for India, the whole world is suffering from over population and it reached over 9 billion by the year 2050. according to the Indian census 2011 the population of India was 1,210,190,420. the over population affects in many dangerous ways like poverty/environmental degradation, depletion of natural resources, rise in unemployment. But the modern bio medicine has given several preventive and effective property of contraceptive for fertility control in both male and female but the chances of success is very minimum and also have minimum side effect. India is said to be the guru of well practised knowledge of herbal name to the place called palashi (West Bengal) INDIA. The glorious historic battle of Plassey fought there. Local said that a tree is a form of Agnidewa, god of fire. It was the goddess parvati who given a curse to him for disturbing her. Many natural habitats plants have the efficacy to treat many disease one of them is *Butea Monosperma* (Lam) Taub (Syn. *Butea Frondosa*; family Fabaceae) popularly known to be as “palas” commonly called as “flame of forest”. The *Butea* genus includes *Butea monosperma parviflora*, *B. minor* and *B. Superba* abundantly found through out the India. The flowers use for hepatic or liver disorder, diarrhea, and is also commonly use in unani, homiopathy and traditional system of medicament. It has a major role in the contraceptive property for both male and female. To prevent the conception the method of contraception is basically the most convenient way, but is generally acquire to prevent or delay the pregnancy. According to the epidemiological studies that the combination of oral contraception increase the risk of cerebral thrombosis and also accelerate the serum level of triglyceride, high density lipids and cholesterol and which ultimately tends for cardiovascular disease as well. There are also many disease which comes with it like malignant tumor, poor glucose tolerance or diabetes, nausea, abdominal pain, headache etc. So for that purpose the importance of plants come which are the most important source of novel pharmacological active ingredient, with many effective drugs affect directly or indirectly. Like anti fungal, anti-aging, anti-inflammatory, properties. Apart from these the plants also have a major role in treatment of fertility, abortifacient property.

When it comes to male contraceptive efficacy it helps in-

- 1) Anti-spermatogenic agents to suppress sperm production
- 2) Inhibit sperm maturation

3) Inhibit sperm motility through vas-deference

4) Prevent sperm deposition

There are number of contraception which are delivering a significant amount of protection from STD I.e. sexually transmitted disease, and unwanted pregnancy.

To get into the modern medicines for under privileged in terms of money and illiterates people is very difficult work. Thus the traditional medicament is the most affordable and in a reach form health care. Therefore, the use of plant products as anti-contraceptive agent cause a minimum side effects v/s the currently contraceptive methods.

In this review we will discuss *Butea monosperma* plant which have a huge use in the contraception, function of testis which ultimately cause infertility, along with some other important functions like-

- a. Antihelminthic properties
- b. antibacterial activity
- c. Anti-diarrhoea activity
- d. Anti-inflammatory activity
- e. Wound healing property
- f. free radical scavenging activity

II. Chemical Constituents

Gum: contains a) Tannin, b) mucilaginous material and c) pyrocatechin

Seed: a) Natural Oil (yellowish-red), b) proteolypolytic enzymes, c) protein binding agent and polypeptidase. (Similar to yeast). An acidic compound, along with d) palasonins is found in seeds. It also contains e) monospermoside

Resin: Jalaric esters I, and laccijalaric esters III, From seed coat acid has been isolated and identified. Z-amyryn, e-sitosterone its glucoside and sucrose; lactone-nheneicosanoic acid-delta-lactone.

Sap: a) Chalcones, b) butein, c) butin, colourless isomeric flavanone and its glucosides,

Bark: a) Kino-tannic acid, b) Gallic acid. The plant also contains c) palasitricin, and glycosides as Butrin, alanind, , histidine

Stem: a) 3-Z-hydroxyeuph-25-ene and b) 2, 14-dihydroxy-11, c) 12-dimethyl-8-oxo-octadec-11-enylcyclohexane.

Leaves: a) Glucoside, b) Kino-oil containing c) oleic and d) linoleic acid, e) palmitic and f) lignoceric acid.

flowers are also good source of a) flavonoids. b) Butein, c) Butrin, d) Isobutrin, e) Plastron, f) coreipsin, and g) Isocoreipsin.

III. Description Morphology

It is an erect, medium sized dry season tree, growing to 15 m tall. It is a not so fast growing tree, young trees have a growth rate of a few feet per year. The leaves with an 8 to 16 cm petiole and three leaflets. The flowers are basically 2.5 cm long, color of orange-red, and developed in racemes up to 15 cm in length. The fruit is apod of 15–20 cm long and 4–5 cm broad. The bark is ash colour.

Leaves: They have 3 foliage, large and stipulate, 10-15 cm long petals. Leafs are dull, having no hair above, finely and conspicuously criss-cross veined beneath with base.

Flowers: They start appearing in the month of Feb and hold on up to the last Week of April. The size is nearly 2 to 4 cm in diameter. These go to be densely crowded on leafless branching. Flowers are 14 cm long,

Calyx: The lower most part of the flower called the calyx and which is dark gray in color, which works as a supporting branch and the upper foremost part are of brick red color

Pods: Coming to the pods the dimension are 12-20 by 2.7-6 cm, which becomes thick at the sutures area.

Seed: The size of the seeds range from 24 to 45 mm long, 25.7 to 25.4 mm wide and 1 to 2 mm thick. The color of seed coat is brown. The hilum is present at the middle part of the bulb edge of the seed.

Fruit: The leguminous property of palash comes with there fruit.



IV. Traditional Uses As Medicine.

Flowers:The basic use of flower is to cure the stomach related problems like digestion problem, stomach ache etc. it also cures leprosy, sanguinary, skin problems, thirst sensation etc.

Nowadays there juice mix is widely used to cure eye infection. The astringent quality of flower is used as an expectorant and also as an emulsifier. Regular treatment of the juice also helps in the treatment of "gonorrhoea" infection. The spleen grows faster and healthier when the extracted dye of flower is taken. They have a huge role in the inflammation and there related pain. For the females it enhances the menstrual cycle flow and in the recent cases found that it is also beneficial for pregnant women in case of diarrhoea. When it comes to males it helps in the genital tract and prevent from the infections. When a flower is trachuate finely and mix with water or milk it helps to prevent mild or even excessive fever to the children. Keep it overnight in water and drink early in the morning with the regular basis it helps in dealing with leucorrhoe. Back in the traditional days it is used in many purposes like anti-convulsant, anti-oxidant, anti-stress, stimulant to the memory and behaviour, also helps for gout treatment anti-protic, reduce and cure ulcer, release toxic from the liver or hepatic region

Seeds:The finely powdered form of seed are basically used for the children to treat their intestinal worms and form an army against them. Seeds are well mixed in the milk or water and on a regular basis about 4tsp is taken to treat from the urinal problems and also to prevent and eliminate the stones in adult. The seeds are digestible, when thoroughly mix with lemon-honey mix and then taken it works as the powerful digestible.

Leaves:The leaves of *B. monosperma* are good for eyes. It works as an appetizer and astringent it is chew-able and the juice which comes out is soaked and helps to cure the cough, cold, and stomach problem. It also helps in the curation of diabetes. The gargle or frequent mouth puffs can be used to treat sore throat problems. For females it helps in the menstrual cycles.

Gum:Gum is best used in the prevention of crack in the foot sole. Other than that it is also used in the problem for dysentery specially for children. It is an astringent to bowel.

Roots:The roots are beneficial to cure the night blindness and other defects of sight, treat elephantiasis. Root pieces are also prescribed for the impotency and it is advised to take heated pieces of root on a regular basis for at least one month every night. The mixture of root powder is also used as an anti-dote against the snake bite.

Stem bark: Stem bark is applied for the treatment of any infection during any injury. The deficiency of thyroid hormone is also treated with the stem juice. When any inflammation occurs the semi solid stem bark paste is applied to cure it. The bark is slightly acidic, bitter in taste, works as an appetizer, aphrodisiac, laxative and is also useful in fractures. Regular intake of bark paste is used for the treatment of liver disorder, gonorrhoea and it also cleans the blood. Also a good medicament in case of scorpion sting.

V. Anti-Helminthic Activity

Helminthic infection means an infection caused by the living organism specially the parasitic worm which harms our body in various ways. It is the most common infection in the human body and also affecting a large number of world population. In majority countries they acquire a large alarming to the common public and accelerate to the prevalence of anaemia, malnutrition, pneumonia. Although the infection related to worms are limited to the tropical region or countries they can occur to the people or tourist over there and infect them and spread through the world. The worms which come under this are Tapeworm scientifically known as (*Taenia solium*), hook worm, round worm and whole *Ascaris family*. People get more affected by this infection in the endemic area with major economic and social consequences. The disease can be treated with a small amount of dose of the *B. monosperma* powdered form

***Butea monosperma* (Lam.) Kuntze** syn.. (Family-Fabaceae) The whole story of anti helminthic property of plant acquired in the seed of *B. monosperma* and it was tested and demonstrated with the sheep suffering from an

infection cause by stomach worm known as *Ascaridia galli*. The type of sixteen carbon lactone compound from seed have been isolated and was experimentally evaluated the possession of anti-helminthic property in the plant. another chemical constituent also evaluated which turns out to be the major medicament for the worm infections and that was Palasonin-against *Ascaris lumbricoids* and *Fasciola hepatica*. The basic mechanism of palasonin is very interesting it firstly inhibit the glucose uptake and poke the glycogen content which ultimately retard the energy producing mechanism of parasite which finally leads to death of the parasites

VI. Anti-Bacterial Activity

The antibacterial property of *B. monosperma* was examined on a gram positive bacteria like *staphylococcus* in an alcohol environment and another gram negative bacteria like *Escherichia coli*. the over all experiment or we can say that the in-vitro antibacterial activity was performed under the disc diffusion method. It is basically Kirby-Bauer method. The initial anti bacterial activity is compared to the standard antibiotic gentamicin. After the experiment the result shows that once the leaves comes in the contact with the ethanol extract it considerably produces an anti bacterial activity. the powdered leaves have an abundant amount of phytochemicals, alkaloids, flavanoids, tannins like compounds which are evident and responsible for its medicinal properties. The above experiment shows that the leaves of *B. monosperma* can be used as an anti bacterial caused by test organism.

VII. Anti-Diarrhoeal Potential Of Flower.

Butea monosperma are the beneficial source of flavonoid. Mainly consist of butein, butrin, isobutrin, plastron etc. Diarrhoea in the recent times emerges out to be the most health problems in the developing countries. The most dangerous and significant symptoms seen in the gastrointestinal problems and is associated with excessive defecation and stool outputs. To eliminate this problem and to also to control into It the WHO also formed a program called diarrhoeal disease control program (CDD) which includes traditional medicine practice, also give a wide emphasis in prevention approach. *Butea monosperma* flower (palas) were collected in the November month 2011 from the Ghaziabad local market, India. The flower were authenticated by the Indian Council Of Agriculture Research (Delhi) in which National Bureau Of Plant Resources comes. Initially the flowers are collected and dried for some specific amount of time and then converted into the powdered form with mechanical grinder and then stored in the air tight large container to prevent from any adulteration and ready for the further extraction process. The basic mechanism of *Butea monosperma* starts with its main chemical component called *ricinoleic acid* which permanently changes the mucosal fluid and changes the electrolyte transportation which is responsible for the hyper secretory action of diarrhoea. The intended extract retard the frequency of defecation significantly decreases and when we compare to the other form of diarrhoeal drug the amount of water or the wetness is also highly reduced. The people in the urban are are very prone to suffer from this disease specially children which ultimately leads to their malnutrition. By considering this the UNESCO and WHO are also very much interested in herbs to use this traditional method as the means of treating the diarrhoea.

VIII. Anti-Inflammatory Activity.

These days the inflammation turns out to be the simple allergic reaction for many decades. There are suppose to be the four marginal symptoms of inflammation that is- *redness, heat, swelling, pain*. The various tissue factor also involves to induce the inflammation such as *histamine, bradikinin* and also *prostaglandins* Inflammation is Homeostatic phenomenon. The *Butea monosperma* flowers as an anti-inflammatory was first and foremost studied by the scientist called Muzushima and Kabayashi with some minor modification using inhibition of albumin denaturation technique. While in the process the standard drug is been taken with calculated amount of test compound and small amount of DMF and diluted with phosphate buffer having a pH of 7.4 in such a way that the DMF concentration must be in between 2.2-2.5%. Diclofenac sodium used as a standard drug. After the experiment the results shows that the anti-inflammatory effect of *Butea monosperma* posses significant properties (topical) to and hence supporting the traditional use for the treatment of rash, heat, swelling etc.

IX. Wound Healing Potential.

The result of the current investigation prove that the extract of *Butea monosperma* flower mainly known as methanolic extract posses a vital wound healing activity in wound models. Off course there is big development in the field of synthetic drug but in spite of all these they are also have some side effect which cannot be ignored and in contrast the traditional form of extract by the flower is way more better deal, and have a unique place and having no side effect. Therefore the approach for traditional means of wound healing must be promoted. The experimental approach of the wound healing activity of the methanolic extract showed the increment rate of wound contraction and epithelialization in the rats. Topical application of the extract on the

open wound accelerated the regeneration of specialized cells by nurturing the surviving cells and connective tissue response characterized by the formation of granulation tissue. As mentioned earlier, the epithelialization process is the renewal of epithelium tissue after injury towards the centre which is largely due to the action of myofibroblasts. On the other hand in the chronic oral administration the extract and the acetone fraction increases the granuloma tissue formation in space dead wound. Granuloma formed a inner foreign body in a dead space comprises of modified macro phages in an accumulated form. The giant cells and undifferentiated connective tissue consist of collagen increases the ingranuloma tissue in the wound dead space and increases the production of protein content as well as angiogenesis. All these process as a whole indicate the wound healing mechanism by the new tissue generation and give us a suggestion that the methanolic extract may stimulate the mechanism associated with tissue regeneration. When we talk about the key factor of all these process of wound healing, the macrophage plays a vital role, they secrete the peptide growth factors that consist of pro-healing effect by stimulating regeneration, fibro-blast proliferation and activation and angiogenesis. And hence it can be concluded that the *Butea monosperma* extract methanolic is beneficial for the wound healing ability with no side effect and stimulate the processes associated with tissue regeneration.

X. Free Radical Scavenging Activity.

The ROS that is Reactive Oxygen Species are generated consistently in the body by both endogenous and extraneous like normal air respiration, by stimulated the polymorpho-nuclear leukocytes, when exposure to the pollutants like tobacco smoke, ionization radiation, organic solvents etc. Other reactive species includes the hydroxyl radical, superoxide, hydrogen peroxide, nitric oxide, and various other lipid peroxides. These species frequently cause the cellular damage by reacting with other biomolecules such as lipids, nucleic acid, several protea and some enzymes. This supposed damage is the main reason to contribute over the many serious disorders like cancer, hepatic ailments, cardiac disease, cataract, immune system disorder, diabetes, inflammation, renal failure, brain disorder and the increase process of ageing. While in the other hand the anti oxidant are the species which are capable of effectively neutralizing the dangerous effect of free radicals. There are various natural antioxidants present in our body such as catalase, superoxide dismutase, glutathione, while some synthetic anti oxidants like butylated hydroxy toluene, and butylated anisole are some how suspected to be carcinogenic and therefore need of ayurvedic form of anti oxidant are greatly use in the recent years. The flower of *Butea monosperma* commonly known as flame of the forest are used for the treatment of the burning sensation in the treatment of gout, leprosy and other serious diseases. According to the the unani study in the flower of monosperma it is found that it contain butein, isobutein and other form of chemical constituents which are responsible for the action of anti-oxidant. The chemical constituent like chalcones and aurones are responsible for the bright color of the flower. Previous studies have shown that the plant has a great potential on the treatment of free radicals and have been reported to be the major factor for their treatment. That is why the *Butea monosperma* also known as the *Free Radical scavenging*. Methanolic extract along with its ethyl acetate and butanol fractions showed potent free radical scavenging activity. The observed activity could be due to higher phenolic contents in the extracts.

XI. Conclusion

The area covered in the studied can be used and analyzed 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 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 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 elephantiasis.

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.

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, there are different studies carried out and administered in accordance, and authenticated. The comparative study will explore much depth about this plant used in the name "Flame of the forest". The phytochemically active constituents of

Butea monosperma were qualitatively analyzed by totally different preliminary screening.

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