WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 8, 193-202. Review Article ISSN 2277–7105

A REVIEW ON PHARMACOLOGICAL PROFILE OF *PALASHA* (*BUTEA MONOSPERMA* (LAM.) KUNTZE) WITH AYURVEDIC INTERPRETATION

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Article Received on 15 March 2026,
Article Revised on 06 April 2026,
Article Published on 16 April 2026,

https://doi.org/10.5281/zenodo.19589463

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How to cite this Article: [1]*Seema H. Kathavadiya, [2]Dr. Dilip K. Jani, [3]Pratik V. Kansagra. (2026). A review on pharmacological profile of *palasha* (*butea monosperma* (lam.) Kuntze) with ayurvedic interpretation. World Journal of Pharmaceutical Research, 15(8), 193–202.

ABSTRACT

The plant kingdom is a treasure house of potential drugs and in the recent years there has been an increasing awareness about the importance of medicinal plants. In *Ayurveda* there are more than 800 medicinal plants documented for various Pharmacological actions. Out of which, *Palasha* is a commonly used herb in *Ayurvedic* medicine. The botanical source of *Palasha* is *Butea monosperma* (Lam.) Kuntze. *Butea monosperma* (Lam.) Kuntze is commonly known as Flame of forest, belongs to the family Fabaceae. Almost all the parts of the plant namely root, leaves, fruit, stem bark, flowers, gum, young branches are used as medicine, food, fibre and for other miscellaneous purposes. It has been found to have antimicrobial, wound healing, antifungal, antidiarrheal, hypoglycaemic, hepatoprotective, antioxidant, anthelmintic, anti-convulsive, antistress, antidiabetic, anti-inflammatory activity. It is observed that most of the screened Pharmacological result were seemed to be already documented in Ayurveda directly or indirectly. Here is a review of screened information verses *Ayurvedic* literature which is validating the claims made by the ancient sages.

KEYWORDS: Ayurvedic Literature, *Butea monosperma*, *Palasha*, Pharmacological results.

INTRODUCTION

The use of *Palasha* was common in *Vedic* period not only to treat the ailments but also in routine life and in holy rituals. In *Vedic* period *Palasha* tree was known as *Shant Vruskha* (peaceful plant) and *Bramhavarchass (*having virtue of *Lord Bramha). Samidha* (wood of the plant for divine purpose) of this plant were used at the time of different *Homa (Process conducted for environmental purification)* and *Yagnyas (environmental purification)*. In the *Puranas*, it is mentioned that one who makes offerings to the deities in a vessel made out of *Palasha* wood gets the benefit of the *Yagnas*. In *Garuda purana*, it is mentioned that during *Margashira shukla trayodashi* (13th day of the waxing moon, in the month of December-January) Lord *Nateswara* should be worshipped with *Kunda* flowers and *Palasha* twigs.[1] In *Bruhatrayees* (three main texts of *Ayurveda* viz *Charaka*, *Sushruta* and *Vagbhata*) is also known as *Palasha and Kinshuka*. Controversy regarding this plant is not seen. Different parts like stem, seed, leaves, flowers *Kshara* are used to treat various diseases. *Acharya Charaka* not classified in *Ganas*. But according to *Acharya Sushruta* and *Acharya vagbhatta*, *Palasha* is included in same *Ganas* like *Ambhasthadi*, *Nyagrodhadi gana* etc.

MATERIAL

- Retrospective study on published paper on pharmacological screening of *Palasha*.
- Ayurvedic pharmacological information available in *Ayurvedic* texts.

METHODS are

- Conceptual correlation of various issues in different disciplines of medicines.
- Logical interpretations of different opinions regarding one issue.

RESULT

The present review attempts to encompass an up to date comprehensive literature analysis on *Palasha* with respect to its pharmacological activities and medicinal properties. The below mentioned are some comparative observations to correlate the pharmacological screening of *Palasha* among conventional methods and *Ayurveda* documentations. Various parts of *B. monosperma* possess several pharmacological actions. We have segregated multiple medicinal properties of different parts of *B. monosperma* such as flower, bark, seed and leaves. The review of the herb summarized the following Ayurvedic tools to apply in various diseased conditions.

Ayurvedic Documentation regarding *Palasha*[2]

Flower – *Rasa* (taste)*: Tikta* (pungent), *Katu* (bitter), *Kashaya* (astringent), *Guna* (properties)*: Snigdha, Laghu, Veerya* (Potency)*: Sheeta* (Cold), *Vipaka* (in post digest stage)*: Madhura (Sweet), Doshaghnata: Kaphapittashamaka.*

Bark, leaf, seed, gum – *Rasa: Katu, Tikta, Kashaya, Guna: Laghu, Ruksha, Veerya: Ushna, Vipaka: Katu, Doshaghnata: Kaphavatashamaka.*

***Rogaghnata*- Flower-** *Trishna, Atisara, Raktapitta, Mootrakrichhra, Mootravarodha, Pradara, Jwara, Daha, Charmaroga, Asthibhanga, Vatarakta, Kustha.* **Bark, leaf, seed, gum-** *Shotha, Apasmara, Agnimandya, Grahani, Krimi, Udara, Gulma, Shoola, Kshayaroga, Prameha, Shukradaurbalya, Dhwajabhanga, Yonisrava, Charmaroga, Vatarakta, Daurbalya, Visha.*

***Karma* – Flower-** *Stambhana, Raktastambhana, Mootrala, Dahaprashamana, Sandhaniya, Virshya.* **Seed-** *Lekhana, Anulomana, Bhedana, Vishaghna, Krimighna, Uttejaka, Kusthaghna, Pramehghna.* **Bark-** *Deepana, Grahi, Yakriduttejaka, Bhagnasandhanakara, Pramehaghna.*

Based on these tools as documented by the traditional philosopher and healer the following interpretations can be made to correlate the conventional screening of the herb. However, the merely identifying the correlated points among the two stream will not serve the purpose.

The actions of various parts of *B. monosperma* are as follows

Table No. 1: Pharmacological activity of Butea monosperma with their Ayurvedic interpretation.

Pharmacological activity	Direct or indirect classical reference	Ayurvedic interpretation
Flowers		
Anticonvulsive activity[3] Due to the presence of a triterpene (tbm) which present in the n-hexane: ethyl acetate (1:1) fraction of the petroleum ether extract of Petroleum ether extract of dried flowers of tbm exhibited anticonvulsant activity against seizures induced by maximum electro	*Rasayana*[33] , *Tridoshaghna*[27,28,29,34], *Artinashana* [34]	By *Rasayana* effect *Palasha* suitable for all obstructive pathological conditions responsible for convulsion. By *Ushna veerya* stimulates nerve which reduce the seizures.

shock.		
Anti-inflammatory activity:[4] The anti-inflammatory activity of methanolic extract of *B. monosperma* evaluated by carrageenan induced paw oedema and cotton pellet granuloma.	*Vatarakta*[29,31], *Kushtha* [28,29,34,30,31], *Kandu*[34], *Gulma*[32,27,28,29,30], *Arsha* [32,27,28,29,30,31], *Vranahara*[26,27,28,29,30,31]	Anti-inflammatory process in the body; especially related with blood mechanism, the herb will be useful in many inflammatory conditions like, *Kushtha, Vatarakta, Gulma, Arsha and Vrana.*
Free radical scavenging activity[5]: Ethyl acetate, butanol and aqueous fraction of *B. monosperma* flower were found to have potent free radical scavenging activity in vitro.	*Rasayana*[33], *Deepana*[32,27,28,29,30,31], *Doshghna*[27,28,29,34]	Free radical is a form of *Ama,* By *Ushna veerya, Katu vipaka* and *Deepan karma palasha* act as a *Agnideepana*(promotor of digestive power). Hence, it digest *Ama* (Free radicals).
Anti-stress activity:[6] Water soluble part of ethanolic extract possess anti stress activity in albino rats.	*Rasayana,*[33] *Artinashana,*[34] *Doshaghna,*[27,28,29,34] *Kushtha* [28,29,34,30,31]	There is no direct reference of the herb on anti-stress but curing the skin diseases, it prevent the psychological distress which is the major issue in dermatology.
Anti-cancer activity[7]: The ability of aqueous extract of *B. monosperma* flowers to impose growth arrest and trigger pro-apoptotic death in cell culture strongly correlated with its strong chemo preventive effect in vivo when given orally in transgenic mice.	*Astrajita*[27,28,30,31] *Vranaha,*[26,27,28,29,30,31] *Gulma,*[32,27,28,29,30] *Rasayana*[33]	There is no direct reference but the efficacy on the various menstrual disease through *Astrajeeta*, curing vicious wounds, supporting to healthiness through *Rasayana* the activity can be considered. Moreover the word *Gulma* can represent cancerous growth at some angle.
Nootropic activity [8]: Ethyl acetate fraction of acetone soluble parts of both the pet ether and ethanolic extract and the methanolic fraction of the acetone soluble part of ethanolic extract of *B. Monosperma* flower exhibited nootropic activity.	*Rasayana,*[33] *Grahi* [27,28,30]	*Ushna veerya* and *Vatashamaka* actions are able to control most of psychological activities.
Anti-microbial activity [9]: The methanolic extract of leaf, stem and flowers of *B. monosperma* were fractionated into n hexane, ethyl acetate fraction of leaf	*Krumighna*[26,32,27,28,29,34,30,31], *Vatarakta,*[29,31] *Kandu* [34], *Vranahara,*[26,27,28,29,30,31] *Jantuyoni* [26]	*Palasha* is documented strongly against *Krumi* along with *Dushta vrana* and *Jantuyoni*. Hence capable to cover maximum range of microbial growth.

show a strong antibacterial activity against Staphylococcus aureus and S. epidermidis.		
Antidopaminergic activity [10]:The methanolic extract, its ethyl acetate soluble fraction and the isoflavone potentiated haloperidol-induced catalepsy and inhibited foot shock-induced aggression in rats in a dose dependent manner confirming the antidopaminergic activity.	*Vatahara*,[32,30] *Deepana*,[32,27,28,29,30,31] *Doshaghna* [27,28,29,34]	This a new information can be incorporated in Ayurveda with some relative terms suggesting *Bhrama*, *Shaithilya*, etc.
Anti-Diarrhoeal activity [11]:Methanolic extract of *B. monosperma* flower showed anti diarrhoeal effect against oil induced diarrhoea in rats.	*Grahi* [27,28,30] , *Kaphapittajita*,[27,28,30,31] *Vatal* [30,31] , *Artinashana*,[34] *Trusha* [28,29,30,31]	*Palasha* is *Ushna veerya*(Helpful in digestion), *Tikta rasa* (useful in endo-toxins- *Ama*) and also it has *Grahi* karma(Act as a absorbent), hence it helpful in *Atisara*(diarrhoea).
Bark		
Hepatoprotective activity [12]: Ethyl acetate fraction from *B. monosperma* bark showed protective effect against thioacetamide-induced pathophysiology in liver of male Wistar rats.	*Kushtha*, [28,29,34,30,31] *Vrana*,[26,27,28,29,30,31] *Arsha* [32,27,28,29,30,31]	According to Ayurveda Liver is the place for *Rakta*, hence any blood diseases as per *Ayurveda* like *Vrana, Kushtha, Kandu, Arsha* etc. There is involvement of liver. The drug is strongly hepatoprotective in this connection.
Thyroid inhibitory [13]: Stigmasterol, isolated from the bark of *B. monosperma* was evaluated for its thyroid hormone and glucose regulatory efficacy in mice.	*Kaphahara*, [27,28,30,31] *Rasayana*,[33] *Deepana* [32,27,28,29,30,31]	It is also cannot be correlate directly, however the said an *Ayurvedic* activities may influence the terminology.
Wound healing activity [14]: The topical application of an alcoholic bark extract of *B. monosperma* in the rats.	*Vranahara* [26,27,28,29,30,31] , *Krumighna*,[26,32,27,28,29,34,30,31] *Jantuyonihar*,[26] *Doshaghna* [27,28,29,34]	The drug directly act on blood disease like skin disease, *Vrana*(Wound), etc. In that sense it improves the quality of blood and resolves any underline pathogen responsible for non-wound healing.
Antifungal activity [15]: The petroleum and ethyl acetate extracts of the stem bark from *B. monosperma* displayed antifungal activity	*Krumighna*,[26,32,27,28,29,34,30,31] *Jantuyonihara*,[26] *Vranahara* [26,27,28,29,30,31]	The antifungal can be broadly categorized through *Krumighna*, *Jantuyonihara* and *Vranahara.*

against *Cladosporium cladosporioides.*		
Anti-Ulcer activity:[16] The methanolic extract of the bark *B. monosperma* is effective against free-radical-mediated gastrointestinal ulcerative diseases.	*Vranahara,*[26,27,28,29,30,31] *Jantuyonihara,*[26] *Krumighna*[26,32,27,28,29,34,30,31]	*Palasha* is Bitter in taste, which is one of the major properties of *Pittahara*. *Pitta* is responsible for the ulcer formation. Hence any ulcerative disease like *Yoniroga, Vrana, Dushtavrana* etc. the *Palasha* will be useful.
Anti-obese activity [17]: The ethanolic extract of *B. monosperma* bark has significant anti-obese activity in rat**.**	*Deepana,*[32,27,28,29,30,31] *Kaphapittaghna,*[27,28,30,31] *Rasayana* [33]	*Palasha* having *Katu, Tikta* and *Kasaya Rasa* and *Katu Vipaka* alleviates *Kapha* and *Meda Dosha*. *Kasaya Rasa* of *Palasha* also alleviate *Kapha* and being *Stambhana* it also decrease *Sharira gata Kleda* Because of its *Laghu Guna* and *Bhedana* action it is *SrotoShodhaka*.
Anti-pyretic activity[18] : The petroleum ether extract of stem bark of *B. monosperma* showed significant antipyretic activity on Brewer's yeast induced albino rats.	*Deepana*[32,27,28,29,30,31], *Kaphapittaghna* [27,28,30,31]	No direct reference but through *Deepana* activity it may influence the febrile conditions.
Aphrodisiac activity [19]: The extract increased significantly mounting frequency, intromission frequency and ejaculation frequency. These effects were observed in sexually active and inactive male rats.	*Vrushya,*[26,27,28,29,30,31] *Sangrahi,*[30,32] *Rasayana* [33]	There is direct reference of the herb as *Vrushya* and *Sangrahi karma*. That means it act as *Shukrajanana* and *Shukrastambhana*.
Seeds		
Antifertility activity [20]: Hot 95% alcoholic extract of seeds of *B. monosperma* had anti ovulatory activity in rabbit.	*Krumighna,*[33,28,29,30] *Kaphavataghna* [28,29,30,31]	*Tikta, Katu, Kashaya rasa* and *Katu vipaka* decrease *Shukra dhatu*. The *Shukra* is common concept in male and female.
Anthelmintic activity [21]: Seeds of *Butea monosperma* administered as crude powder (cp) at doses of 1, 2 and 3 g/kg to sheep naturally infected with mixed species of gastrointestinal nematodes exhibited a dose and a time dependent anthelmintic	*Krumighna,*[33,32,28,29,30] *Kushtha,*[28,29,30,31] *Dadru,*[34] *Pama,*[34] *Kandu ,*[34] *Twagdosha,*[34]	Being *Tikta Katu rasa* and having *Katu vipaka* and also it has *Krimighna* effect, Hence, it can cover all the range of parasite growth.

effect. methanol extract of *Butea monosperma* seeds showed significant anthelmintic activity in-vitro.		
Anti-conceptive activity[22] : Butin which is isolated from the seeds administered orally to adult female rats at the doses of 5, 10 and 20 mg/rat from day 1 to day 5 of pregnancy showed anti-implantation activity in 40%, 70% and 90% of the treated animals, respectively.	*Kaphanashana* [32,27] *Jantuyoni* [26]	It a new contribution to the conventional Pharmacological screening of herbs.
Antidiabetic activity [23]: Ethanolic extract of seeds (300mg/kg b.w.) exhibited significant antidiabetic, hypolipidemic and antiperoxidative effects in non-insulin dependent diabetes mellitus rats.	*Meha,*[27,28,29,30,31] *Kaphaghna,*[32,27] *Krumighna* [33,32,28,29,30]	*Kapha, Abadhha Meda* and *Vata* are main factors in pathogenesis of *Madhumeha*. *Palasha* having *Katu, Tikta* and *Kasaya Rasa* and *Katu Vipaka* alleviates *Kapha* and *Meda Dosha* involved in all types of *Prameha*. It also has *Kapha Vatasamaka* action which is desirable in treatment of *Madhumeha*.
Anti-oxidative activity [24]: Oral administration of the ethanolic extract of the *B. monosperma* seeds exhibited significant antidiabetic, hypolipemic and antiperoxidative effects in non-insulin dependent diabetes mellitus rats.	*Rasayana* [33], *Deepana* [32,27,28,29,30,31]	The drug is *Rasayana* in nature. It means *Rasa* (body fluids) and *Ayana*(proper circulation and nutrition) Hence will act on any pathological activity.
Leaves		
Anti-filarial activity [25] : Methanol/hexane ethanol extract of *B. monosperma* leaves showed significant anti filarial activity against Setaria cervi in vitro system.	*Kruminashana,* [33,32,28,29,30] *Deepana,* [32,27,28,29,30,31] *Doshghna* [27,28,29,34]	Absolutely no direct reference, but the said actions can cover it. But anti filarial remain the new contribution from the conventional Pharmacological screening of herbs.

DISCUSSION

India has a centuries old system of medicine which has its own systematic information on drugs, their formulation and their use in humans, called the *Ayurvedic* system and also other traditional systems like Siddha and Unani. *Ayurveda*- the science of life is oldest repository of medical sciences of ancient India. It has two basic objects i.e. maintenance of health and

cure of disorders. There has been worldwide renewal of interest in herbal system of medicines. Side effects of allopathic drugs have scared people all over the world and there is a consorted effort to find an alternative therapeutic method. Literature shows tremendous scope for the use of plant *Butea monosperma* as an alternative therapy in the treatment and prevention of various diseases and disorders The extracts of different parts might be added value in the scientific evaluation of medicinal application of *Butea monosperma*. Many pharmacological investigations have been carried out based on its chemical constituents. Extensive literature survey revealed many pharmacological properties includes antimicrobial, antifungal, anticancer, anti-stress, anticonvulsant, antidiabetic, hepatoprotective, antiulcer, antioxidant and wound healing activities.

CONCLUSION

Herbal medicines are the natural remedies which are used to recover the alterations made in normal physiological functioning of the body by foreign organisms. The traditional health care system, which is culturally patterned, in rural communities, seems to be the first and foremost line of defence. It is necessary to have a proper documentation of medicinal plants and to know their potential for the betterment of health and hygiene through an eco-friendly system. *Butea monosperma* is a gracious and medicinal plant. All parts of *Butea monosperma* have different uses. It would be right to say that nature has blessed us with this herb. The tree has the very beautiful look due to its flowers and is called as the 'Flame of the Forest'. Various chemical constituents have various activities from which it is being used tremendously in Ayurvedic formulations. Understanding the importance of natural products further experiments can be undertaken to explore more use of plant *Palasha* or *Butea monosperma* derived products.

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