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Review Article

An Updated Review on Phytochemical and Antiulcer Properties of *Butea Monosperma*

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ABSTRACT

Butea monosperma (Lam.) is an indispensable tree. Tribals use its flowers and young fruits. The plant is used in Ayurvedic, Unani and Siddha medicine for various ailments. Methanolic extract of the bark B. monosperma is effective against free-radical-mediated gastrointestinal ulcerative diseases. The properties of plant like hepatoprotective, anti-fertility, anti-filarial, anti-diabetic, antiviral, anthelmintic, anticonvulsant, antifungal, antimicrobial, antiestrogenic, anticancer, anti-inflammatory, antioxidant, antiulcer, wound healing, anti-diarrhoeal, anti-implantation, anti-dopaminergic, antimycobacterial, osteogenic and osteoprotective activity. The current review focused on following Anti-ulcer activity. These medicinal properties may provide potential active principles with higher efficacy and minimum side effects as compared to available synthetic drugs. article briefly reviews the botany, chemistry and pharmacology of Butea monosperma (Lam) Kuntze.

INTRODUCTION

Butea monosperma (Lam.) is commonly known as Flame of forest, belongs to the family Fabaceae. It is evident that without nature human being life is impossible. There are three basic necessity of humans is food, clothes and shelter and now the fourth one is good health, which provided by plant kingdom. Nature stands a golden mark and provided the storehouse of remedies to cure all ailments of mankind. Plant kingdom represents a rich house of organic compounds, many of which have been used for medicinal purposes and could serve as lead for the development of novel agents having good efficacy in various pathological disorders in the coming years. Herbs have always been the principal form of medicine in India and presently they are becoming popular throughout the world.[2] Almost all the parts of the plant are being used since decades in medicine and for other purposes. These days herbal medicines are more popular than modern medicine because of their effectiveness, easy availability, low cost and for

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being comparatively devoid of side effects.[1] In Ayurvedic system of medicine, the flowers of Butea monosperma Lam (Leguminosae) commonly known as 'Flame of the forest', are used for relieving burning sensation.[3] Butea monosperma (Lam.) kuntze is one among four species belonging to the genus Butea Koenig, three species of which occur in India. It holds an important place because of its medicinal and other miscellaneous uses of economic value. Bark fibres are obtained from stem for making cordage. Stem bark powder is used to stupefy fishes. Young roots are used for making ropes. Green leaves are good fodder for domestic animals. Leaves are used for making platters, cups, bowls and beedi wrappers. Leaves are also used for making Ghongda to protect from rains and are eaten by buffaloes and elephants. Tribals use flowers and young fruits as vegetables. Flowers are boiled in water to obtain a dye. Orange or red dye is used for colouring garments and for making skin antiseptic ointments. Fresh twigs are tied on horns of bullocks, on occasion of 'Pola' and dry twigs are used to feed the sacred fire. In addition, wood of the plant is mainly used for well-curbs and water scoop. It is also employed as a cheap board wood and for structural work, wood pulp is suitable for newsprint manufacturing.[1]

Plant Profile

Taxonomical Classification: - [1]

Kingdom : Plantae, Plants.
Phylum : Magnoliophyta
Class : Magnoliopsida
Order : fabales
Family : Fabaceae
Tribe : Phaseoleae
Genus : Butea

Synonyms : Butea braamania DC; Butea frondosa Roxb; Butea frondosa Willd; Butea frondose Willd. var. lutea (Witt.) Maheshw; Plaso monosperma (Lam.) Kuntze; Plaso monosperma Kuntze var. flava Kuntze; Plaso monosperma (Lam.) Kuntze var. rubra Kuntze.

Geographical distribution:- [1]

Asia: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Java, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam.

India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Dadra-Nagar-Haveli, Delhi,

Gujarat, Haryana, Himachal Pradesh, Jammu-Kashmir, Karnataka, Kerala, Madhaya Pradesh, Maharashtra, Meghalaya, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

Parts used: Flowers, seeds, fruits, leaves, gum and bark are used.

Ayurvedic description: - [4]

Sanskrit **:** Palasa.

1. **Common general properties:**

rasa–katu, tikta, kasaya; guna-laghu, sigdha; veerya-ushana; vipak-katu.

2. **Action and uses:**

Kapha vat samak, kaoha pitta samak, lakhan, soth har, badana sthapan, dipan, grahi, anuloman, dah prasaman, rat stambham, rakt sodhan, veersya, rasayan.

Images of plant

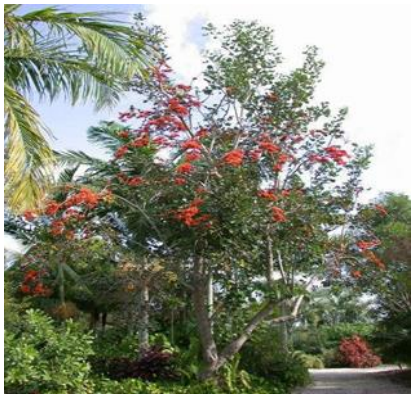

Fig. 1 Butea monosperma (Lam.) Kuntze

Fig. 2. Butea monosperma (Lam.) Kuntze (A) – Flowers, (B) –Leaves

Pharmacological activity

Antifungal activity, antimicrobial activity, antibacterial activity. The stem bark of Butea monosperma displays antifungal activity, which is due to the presence of an active constituent (-)-medicarpin. The seed oil of Butea monosperma shows significant bactericidal and fungicidal effect in in-vitro testing.[5]

Anti-inflammatory activity

The leaves of Butea monosperma exhibit ocular anti-inflammatory activity in rabbits.[6] The anti-inflammatory activity of methanolic extract of Butea monosperma evaluated by carrageenin induced paw oedema and cotton pellet granuloma. In carrageenin induced paw oedema at 600 and 800 mg/kg inhibition of paw oedema, by 26 and 35% and in cotton pellet granuloma inhibition of granuloma tissue formation, by 22 and 28%.[7]

Liver disorders

An extract from the flowers of Butea monosperma is used in India for the treatment of liver disorders and two antihepatotoxic flavonoids, isobutrin and butrin have been isolated from the extract. [8] 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. [9]

Antiestrogenic and antifertility activity

Alcoholic extract of flowers of Butea monosperma has also been reported to exhibit antiestrogenic. Hot alcoholic extract of Butea monosperma seeds have been reported for significant anti ovulatory

and anti-implantation activities when given to rats and rabbits. The active constituent has been identified as Butin. Butin also exhibits male contraceptive properties. Antifertility effect of seed extract of Butea frondosa has also been reported in mice. The stem bark of Butea monosperma, led to the isolation and identification of three new compounds named buteaspermin A, buteaspermin B and buteaspermanol, along with 19 known compounds. [2]

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.Oral administration of the ethanolic extract of the Butea monosperma seeds at the dose of 300mg/kg b.w., exhibited significant antidiabetic, hypolipidemic and antiperoxidative effects in non-insulin dependent diabetes mellitus rats. [10]

Giardiasis

Giardiasis is a common gastrointestinal infection caused by a protozoa1 parasite, Giurdia lamblia.

Pippali rasayana (PR), an Ayurvedic herbal medicine, prepared from Piper longum (Pippali) and Butea monosperma (Palash) in which ash of stem, root, flower and leaves of Butea monosperma is used, has significant activity against Giardiasis It produced up to 98% recovery from the infection. The rasayana had no killing effect on the parasite in vitro. It induced significant activation of macrophages as evidenced by increased macrophage migration index (MMI) and phagocytic activity. With higher doses of PR recovery increased up to 98% at 900 mg/kg (63) Flowers of this plant are also effective in leprosy, leucorrhoea and gout. [2]

Free radical scavenging

Free radical scavenging activity of various extracts of flowers evaluated by using different in-vitro models like reducing power assay, scavenging of 2,2 diphenyl-1-picrylhydrazyl (DPPH) radial, nitric oxide radical, superoxide anion radical, hydroxyl radical and inhibition of erythrocytes haemolysis using 2,2’ azo-bis (amidino propane) dihydrochloride (AAPH). 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. [11]

Thyroid inhibitory, antiperoxidative and hypoglycaemics effects

Stigmasterol, isolated from the bark of Butea monosperma was evaluated for thyroid hormone and glucose regulatory efficacy in mice. the administration at 2.6 mg/kg/d for 20 days reduced serum triiodothyronine (T3), thyroxin (T4) and glucose concentrations as well as the activity of hepatic glucose- 6-phophatase (G-6-Pase) with an increase in insulin. Showed its thyroid inhibiting and hypoglycaemic properties. Antioxidative potential due to decrease in the hepatic lipid peroxidation (LPO) and an increase in the activities of catalase (CAT), superoxide dismutase (SOD) and glutathione (GSH). The highest concentration tested (5.2 mg/kg) evoked pro-oxidative activity.[12- 68]

Anti-Ulcer and Anti-oxidant activity

The different concentration of methanolic extract (10, 25 and 50 µg/ml) was evaluated for the anti-oxidant activity by employing various in vitro anti-oxidant models. It was observed that free radicals were scavenged by the test compound in a concentration dependent manner. The maximum percentage inhibition in all the models including CCl4-induced lipid peroxidation, reducing power,

superoxide anion and hydroxyl radical scavenging activity were found to be 72.47, 75.86, 68.11 and 77.46% respectively at 50 µg/ml concentration. Sodium metabisulphite was used for the reference standard for comparison of all the models.[13-68]

CONCLUSION

On the basis of the present results and available reports, it can be concluded that the anti-ulcer activity elucidated by B. monosperma bark could be mainly due to the modulation of defensive factors through an improvement of gastric cytoprotection and partly due to decreased acid secretion. The results also supported the n vitro anti-oxidant effects of the methanolic extract of the bark B. monosperma involving in the scavenging process of free radical generation.

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