



## A Review on Antifungal Soap By Using Butea Monosperma Formulation

*Vijay Satish Ambhore<sup>1</sup>, Prof. Bhagyashali Pawar mam<sup>2</sup>*

<sup>1</sup> B.Pharm Final Year, Gajanan Maharaj College of Pharmacy, Chh. Sambhajinagar

Email: vijayambhore2209@gmail.com

<sup>2</sup> (M.Pharm) Department of Quality Assurance, Gajanan Maharaj College of Pharmacy, Chh. Sambhajinagar

### ABSTRACTION:

Butea monosperma is an exceptional medicinal plant with numerous applications. It has been utilized for its therapeutic properties, including antifungal, anti-inflammatory, antibacterial, anticancer, and antidiabetic effects, as well as its inherent resistance to fungal infections. This study assessed the antifungal efficacy of different extracts from Butea monosperma against the *Cladosporium cladosporioides* fungus.

### INTRTODUCTION:

Butea monosperma is an exceptional and remarkable plant. It is widely referred to as Palash in Hindi. It belongs to the Fabaceae family. It is indigenous to Bangladesh, India, Nepal, Pakistan, Thailand, Sri Lanka, Western Indonesia, and Myanmar. Absent in arid places, predominantly located in extensive areas of India, particularly at elevations up to 1000 meters above sea level or higher in the outer Himalayas. It thrives in wet situations, saline and alkaline soils, black cotton soil, and arid areas. Palash is referenced in the Upanishads, Vedas, Susruta Samhita, Charaka Samhita, Astanga Sangraha, and Ashtanga Hridaya. It is referred to as the Flame of the Forest. It is referred to by various vernacular names, as presented in Table 1. It reaches a height of 10-15 meters, with uneven branches and a crooked trunk. The branches are ash-colored. The leaves are trifoliate, with petioles of 13-17 cm in length, and the stipules are linear and lanceolate. The flowers exhibit an orange-red hue. The calyx is 13mm in length and is olive green in hue. The corolla measures between 2.8 to 6 centimeters in length. It has a variety of chemical elements utilized in the treatment of numerous disorders, including epilepsy, inflammation, stress, and diabetes. The gum extracted from the incision made on the tree is an effective astringent. It is referred to as 'Kamarkas' and Bengal Kino, utilized in various recipes and serves as a source of tannin in the leather industry. It serves as a replacement for Kino gum. The pigment found in Palash flowers, which gives them their color, is utilized as a pesticide and coloring agent. It is regarded as a sacred tree. Utensils are crafted from the wood of Butea monosperma. The desiccated stem is utilized to create sacred fire. Flowers substitute for blood in religious rituals. It serves as the host for the lac bug and contributes to lac production. The astringent components of gum have been referenced by the Chakradattapani.

### Literature review

1. Systemic Review on Palash-Butea Monosperma Lam. Kuntez. Shivani Sharma, Harisha CR2 1 PhD scholar. 2 Head Pharmacognosy Department, ITRA (2018)
2. A REVIEW ON PHARMACOGNOSTIC STUDY OF BUTEA (2017) MONOSPERMA Aditya Gupta 1, Shubham Singh 2. Khushboo Gaur 3. Abhishek Singh 4, Lalt Kumar 5
3. Laboratory Diagnosis of Fungal Infection - A Review. Gagan Shamal, Sujata Saxena<sup>2</sup>, Priyanka Singh<sup>3</sup>, Sanjay Kumar Singh<sup>4</sup> (2021)
4. Fungal Infections. Their Diagnosis and Treatment in Transplant Recipients. David H. Van Thiel, Magdalena George and Christopher M. Moore (2012)

### BOTANICAL CLASSIFICATION:

- Kingdom : Plantae
- Sub Kingdom : Tracheobionta
  - Division: Magnoliophyta
  - Class: Magnoliophyta
  - Order: Fabales
  - Family: Fabaceae
  - Genus: Butea
  - Table. Palash Ayurvedic Properties

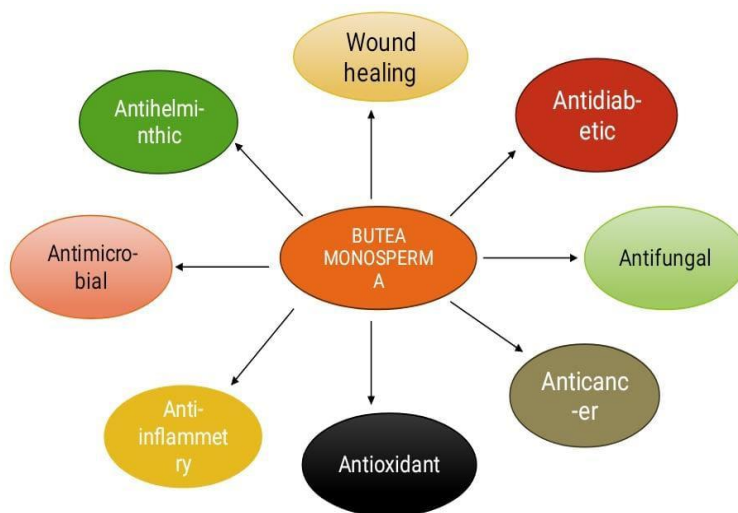
- Species: Monosperma

#### Synonyms of Palash

- Palash: Leaves are beautiful as well as fleshy
- Ksharashrestha: Good source of alkali (Kshar)
- Parna (Leaf): Leaves are useful
- Yajniya: Used in religious rituals
- Raktapuspa: Flowers are red in color (the color of blood or rakta)
- Vatapotha: Pacifies vata (constitution)
- Bijanesha: Seeds (beej) are oily
- Vakrapushpa: Its flowers (pushpa) are curved
- Krmighna: Potent anthelmintic drug
- Kharaparna: Leaf is rough to touch
- Putadra: Sacred tree
- Samidvara: Useful in Yajna (ritual sacrifice with a specific objective)



#### THERAPEUTIC USES OF BUTEA MONOSPERMA :



#### PHARMACOLOGICAL ACTIVITIES OF BUTEA MONOSPERMA :

Activity		Details
Anticoceptive	Seed	Administered orally to adult female rats at dosages of 5, 10, and 20 mg/rat from day 1 to day 5 of gestation exhibited anti-implantation effects in 40%, 70%, and 90% of the treated subjects, respectively. At reduced dosages, there was a dose-dependent cessation of pregnancy and a decrease in the number of implantation sites (Bhargava, 1986; Pandey, 2001).

Antidiabetic	Flowers,Seeds	single ethanolic extract at a dosage of 200 mg/kg orally. Substantially enhanced glucose tolerance and resulted in a decrease in blood glucose levels in alloxan-induced diabetic rats. The oral treatment of the ethanolic extract of the seeds at a dosage of 300 mg/kg body weight shown substantial antidiabetic, hypolipidemic, and antiperoxidative effects in rats with non-insulin dependent diabetes mellitus (Somani et al., 2006; Sharma et al., 2009; Bavarva et al., 2009; Akhtar, 2010).
Anthelmintic	Seeds	Seed supplied as crude powder at doses of 1, 2, and 3 g/kg to sheep naturally infected with mixed species of gastrointestinal nematodes, demonstrated a dose- and time-dependent anthelmintic effect. A maximum reduction of 78.4% in eggs per gram of feces was observed on day 10 following treatment with 3 g/kg. Levamisole (7.5 mg/kg), a conventional anthelmintic drug, demonstrated a 99.1% reduction in eggs per gram. The anthelmintic efficacy of various Butea species has been documented against <i>Ascaridia galli</i> , <i>Ascaris lumbricoides</i> , earthworms, <i>Toxocara canis</i> , <i>Oxyurids</i> , and <i>Dipylidium caninum</i> .
Antimicrobial, Antifungal	Bark	The stem bark of <i>Butea monosperma</i> exhibits antifungal properties attributed to the active compound medicarpin. Additionally, the seed oil of <i>Butea monosperma</i> demonstrates notable bactericidal and fungicidal effects in in vitro assays (Bandara et al., 2001; Mehta et al., 1981).
Antitumor	Flowers	The intraperitoneal administration of the aqueous extract of <i>Butea monosperma</i> flowers in X-15-myc oncogenic mice demonstrated antitumorigenic activity by preserving liver architecture and nuclear morphometry, while also downregulating serum VEGF levels. Immunohistochemical staining of liver sections with anti-ribosomal protein S27a antibody revealed the post-treatment abolition of this effect.
Wound Healing	Stem Bark	The topical application of an alcoholic extract from the stem bark of <i>Butea monosperma</i> was evaluated for its effects on cutaneous wound healing in rats. Full-thickness excision wounds were created on the dorsal region of the rats. Granulation tissue collected on days 4, 8, 12, and 16 post-wound was analyzed for total collagen, hexosamine, protein, DNA, and uronic acid content. The extract enhanced cellular proliferation and collagen production at the wound site, as demonstrated by the increase in DNA, total protein, and total collagen content of granulation tissues. The extract-treated wounds exhibit significantly accelerated healing compared to untreated animals, as evidenced by enhanced epithelialization, wound contraction, tensile strength, and histological analyses. <i>Butea monosperma</i> demonstrated wound healing capabilities attributable to its antioxidant characteristics.
Anti -Diarrhoeal	Stem Bark	The ethanolic extract of the stem bark of <i>Butea monosperma</i> (Lam) Kuntz, administered at dosages of 400 mg/kg and 800 mg/kg, effectively inhibited castor oil-induced diarrhea in Wistar albino rats by suppressing gastrointestinal motility and PGE2-induced enteropooling, as well as reducing gastrointestinal motility following charcoal meal administration. The gum of <i>Butea monosperma</i> has proven beneficial in instances of persistent diarrhea. It is a potent astringent and also reduces bilirubin levels.

## PHYTOCONSTITUENT:

### Flower:

Monospermoside (butein 3-e-d-glucoside), isomonospermoside, butin, chalkiness, aureoles, flavonoids (palasitrin, prunetin), steroids, triterpene, butein, isobutrin, coreopsin, isocoreopsin (butin 7-glucoside), and sulphurein.

### Leaves:

Glucoside, Kino oil including oleic and linoleic acid, palmitic and lignoceric acid.

**Bark:**

Kino-tannic acid, gallic acid, pyrocatechin. The plant includes palasitrin and significant glycosides such as Butrin, butolic acid, cyanidin, allophanic acid, histidine, lupenone, lupeol, (-)-medicarpin, miroestrol, palasimide, and shellolic acid. Two compounds: 3,9-dimethoxypterocarpan and triterpenoid ester 3 $\alpha$ -hydroxyeuph-25-enyl heptacosanoate.

**Root-** The root of *Butea monosperma* comprises glucose, glycine, a glycoside (aglycon), and an aromatic hydroxy molecule. .

**Stem:** Stigma sterol-e-D-glucopyranoside, nonacosanoic acid, 3-Z-hydroxyeuph-25-ene, and 2, 14-dihydroxy-11, 12-dimethyl-8-oxo-octadec-11-enylcyclohexane (Gunakkunru et al., 2005; Agarwal et al., 1994).

**Gum:**

Tannins, mucilaginous material, pyrocatechin.

**Seed :**

Nitrogenous acidic compounds, along with palasonin, are present in seeds. It also comprises monospermoside (butein 3-e-d-glucoside), tasteless yellow oil, proteolytic and lipolytic enzymes, plant proteinase, and polypeptidase.

**Resin:**

Nitrogenous acidic compounds, along with palasonin, are present in seeds. It also comprises monospermoside (butein 3-e-d-glucoside), tasteless yellow oil, proteolytic and lipolytic enzymes, plant proteinase, and polypeptidase.

**Sap:**

Colourless isomeric flavanone and its glucosides, butrin, chalcones, butein, butin

**ACTIVE CHEMICAL CONSTITUENT:**

Medicarpin (M),

An isoflavonoid phytoalexin possessing antioxidant and antifungal activities is synthesized by leguminous plants mostly in reaction to biotic or abiotic elicitation.

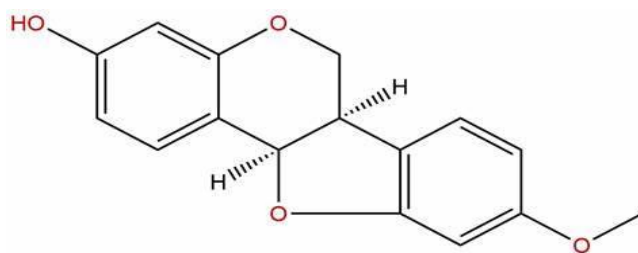


Fig: structure of medicarpin

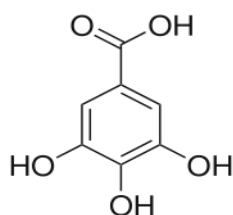


Fig :Structure Of Gallic Acid

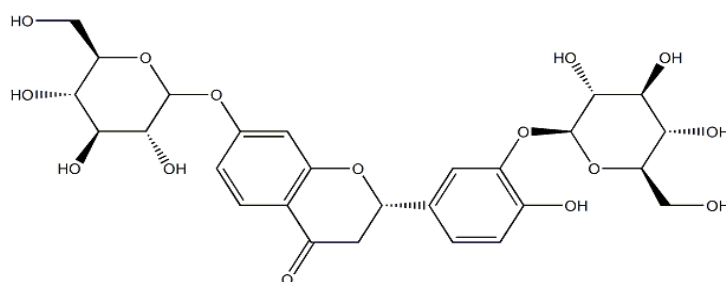


Fig :Structure of Butrin

**Fungal Infection:**

Definition: -

A fungal-induced inflammatory disease. fungal infection. Zymosis refers to the progression and dissemination of an infectious disease, particularly one induced by a fungus. Blastomycosis denotes various infections affecting the skin or mucous membranes produced by the organism Blastomyces. Fungal diseases are prevalent throughout most of the natural world. In humans, fungal infections arise when an invading fungus colonizes a region of the body, overwhelming the immune system's capacity to manage it. Fungi can inhabit the atmosphere, soil, aquatic environments, and flora. Certain fungi also inhabit the human body naturally.

**Type of fungal infection:**

Superficial:

Affect skin –

mucous membrane. e.g. tinea versicolor dermatophytes: Fungi that affect keratin layer of skin, hair, nail. e.g. tinea pedis, ring worm infection Candidiasis: Yeast- like, oral thrush, vulvo-vaginitis, nail infections.

Deep infections:

Affect internal organs as: lung, heart, brain leading to pneumonia, endocarditis, meningit

**Overview of Fungal Skin Infections:**

Fungi typically inhabit moist regions of the body where skin surfaces converge: between the toes, in the vaginal region, and beneath the breasts. Fungal skin infections typically arise from yeasts, including Candida and Malassezia furfur, or dermatophytes such as Epidermophyton, Microsporum, and Trichophyton. Numerous fungi inhabit exclusively the uppermost layer of the epidermis (stratum corneum) and do not infiltrate farther. Individuals with obesity are at an increased risk of developing these infections due to the presence of excessive skinfolds, particularly when the skin within a skinfold becomes irritated and compromised (intertrigo). Individuals with diabetes exhibit increased vulnerability to fungal infections. Curiously, fungal infections in one area of the body can induce rashes in other, non-infected regions. A fungal infection on the foot may result in an itchy, bumpy rash on the fingers.

**Symptoms**

- Skin changes, including red and possibly cracking or peeling skin.
- Itching.

**Causes of fungal skin infection:**

- Imbalance of bacteria is due to following reasons
- Due to use of antibiotics
- Hormone imbalance
- Poor eating habits

**Classification Of Fungi:**

There are varioustypes of fungal infection but commonly infections are ringwarm and yeast infection

**Ringworm:**

Ringworm is a prevalent fungal condition affecting the skin and nails. The illness is termed “ringworm” because to its ability to produce an itchy, red, circular rash. Ringworm, commonly referred to as "tinea" or "dermatophytosis," is categorized by many forms based on the infection's anatomical location.

Tinea pedis-which is also called as ‘athlete foot’ this infection commonly affect teen and male adults .



b)Tineacuris-which is also called as ‘jock itch’ many times this infection may be hard to cure .



C)Tinea capitis- this type of tinea is called as scalp ringworm which is usually cure by ketoca



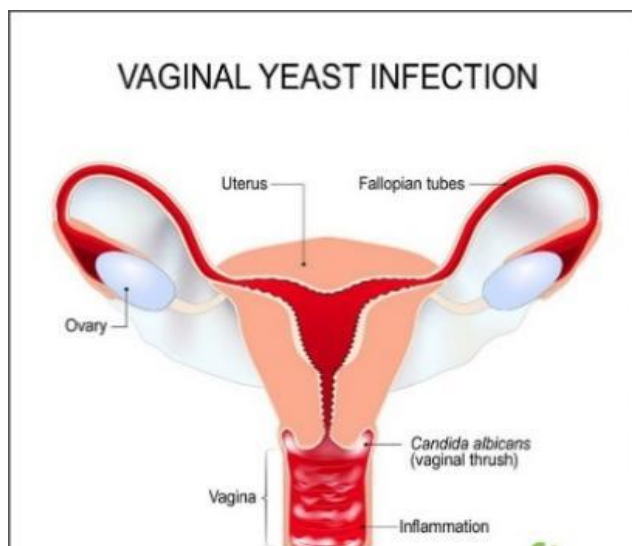
d)Tinea unguium- this type of infection is cause is nails finger as well as toes



e).Tinea corporis- this tinea cause anywhere on body so it is called as body ringworm and is causes large number of peo .



2.Yeast Infection :A yeast infection is a fungal infection that causes irritation, discharge and intense itchiness of the vagina and the vulva — the tissues at the vaginal opening. Also called vaginal candidiasis, vaginal yeast infection affects up to 3 out of 4 women at some point in their lifetimes

**Fungal Disease:**

*Cladosporium cladosporioides* is categorized within the Fungi imperfecti (Deuteromycota) group.

*Cladosporium* are commonly located in both outdoor and indoor settings, where decaying organic waste serves as significant food pollutants.

Bioactive metabolites derived from *Cladosporium cladosporioides*

1. p-Methylbenzoic acid
2. Ergosterol Peroxide (EP)
3. Calphostin (C)

Enzymes produced by *Cladosporium cladosporioides*

Pectin methylesterase (PME) and polygalacturonase (PG)

Chlorpyrifos hydrolase

**SOAP DEFINITION:**

Soap is a fatty acid salt utilized in various washing and lubricating applications. In a home context, soaps are surfactants typically employed for washing, bathing, and various household tasks. In industrial environments, soaps serve as thickeners, constituents of some lubricants, and precursors to catalysts.

**Antifungal Soap:**

An antifungal soap contains fungus-fighting ingredients like miconazole and ketoconazole but many use natural ingredients like coconut oil & Alovera oil

**Advantage:**

1. It addresses the illness with little side effects.
2. It possesses calming qualities for the skin.
3. Mitigates skin irritation
- Four. Applicable for the entire body, including delicate areas.
5. Rapidly permeate the dermis
6. Refined non-grassy formulation

**Disadvantage:**

1. Itching,
2. Redness,
3. Dryness,
4. Burning and stinging sensation

**PLAN OF WORK:**

The purpose of the present study was to formulate and evaluate antifungal soap to give fungicidal or fungistatic effect.

The soap was prepared by using chemicals like, glycerin, alcohol, caustic soda, stearic acid, propylene glycol

The soap was prepared by homogenous mixing of all the excipient

**MATERIAL :****CHEMICALS:**

1. Soap Base ( lye solution, glycerin, alcohol, coconut oil, stearic acid, propylene glycol )
2. Goat Milk use
3. Aloeverea Gel
4. Essential Oils

**Active ingredients:** 1.Medicarpin

**Equipments:** 1.A glass measuring cup, a microwave, and a water bath

2.Moulds for soap

3.Digital balance

4.stirring rod

#### SOAP BASE MAKING PROCESS:

Sr.	Name of chemicals	Quantity
1	Distilled water	40gm
2	Caustic soda	10gm
3	Coconut oil	50gm
4	Stearic acid	30gm
5	Glycerin	20gm
6	Alovera oil	70gm
7	Propylene glycol	90gm
8	Goat milk	20gm

After heating these all ingredients with each other until they become a desirable solution.

After blending them completely, pour it into a mould. Leave it for one day and then the soap base was ready

#### SAOP MAKING PROCESS:

##### Steps:

1.The goat milk must be measured and cut.

2.Grind the Butea monosperma and strain it through a number 150 sieve to achieve a fine consistency. powder

3. Subsequently, combine the finely powdered butea monosperma with the prescribed excipients below.

Aloe vera juice is derived from the aloe vera plant, together with amla oil.

5. Thoroughly amalgamate these ingredients prior to incorporating them into the goat milk.

6. Melt the soap base into a liquid and thoroughly integrate all ingredients during the heating process.

7. After incorporating the essential oil, coconut oil, and glycerin. Pour the liquid into the mold and position it in the refrigerator to remain undisturbed for approximately two hours before to removal.

8.Permit a duration of one day for it to rest.

#### EVALUATION OF SOAP:

The following Physico-chemical parameters were assessed for determining the quality of prepared formulation against marketed herbal Soap.

##### Physical parameters

The color and clarity of the prepared soap were observed with naked eye keeping it on white background. The order of the soap was smelled.

##### pH

The pH of the formulated soap was assessed using a digital pH meter. The produced formulation was dissolved in 100 ml of distilled water and allowed to stand for 2 hours. The pH of the solution was measured using a previously calibrated pH meter.

##### 3) % free Alkali content



A beaker holding 10g of dried soap was subsequently filled with 150 ml of pure water. The soap was dissolved by heating it for 30 to 40 minutes at reflux in a water bath. The solution was chilled and transferred, along with the washings, to a 250 ml conical flask, and the volume was containing distilled water. Two drops of phenolphthalein indicator were introduced to 10 ml of the soap solution in the titration flask. The solution was subsequently titrated. against 0.1M HCl till it became colorless.

#### 4) Foamability

Fifty milliliters of distilled water were measured, and two grams of soap sample were entirely dissolved through stirring. The solution was subsequently put into a 250 ml measuring cylinder, including the washings. The volume was adjusted to 200 ml by the addition of distilled water. Twenty-five identical blows were administered to The combination was allowed to stand undisturbed until the water volume reached 200 ml. The foam height was assessed from above the water volume. Foam stability: identical quantity of The soap sample and the quantity of distilled water were combined, and the process was conducted to assess foamability and the resulting mixture.

#### 5) Moisture Content:

A sample of soap weighing 10g was immediately measured and recorded as the "wet weight of the sample." The moist sample was dried to a consistent weight using the suitable drying equipment. a temperature not to surpass 115°C. Subsequent to cooling, the sample was reweighed to ascertain the "dry weight."

#### 6) Alcohol insoluble matter:

Fifty milliliters of warm ethanol were added to a conical flask containing a 5-gram sample of soap to facilitate its dissolution. The liquid was filtered using tarred filter paper and 20 cc of warm ethanol.

Filtered and thereafter dried at 150°C for one hour. The weighted filter paper had desiccated.

### Discussion

The physico-chemical and biological characteristics of the formulated soap were analyzed. The composition exhibited an appealing look, accompanied by a pleasing fragrance and hue. The pH was determined to be Within the required range of 7 to 10. Additional characteristics such as percentage of free alkali content, The foamability, foam stability, moisture content, and alcohol-insoluble materials were assessed, indicating the standard values for soap.

### RESULT:

the obtained evaluation are summarized below in table

PARAMETERS	PREPARED SOAP	MAEKET SOAP
Physical parameter	order:pleasant Colure: Brown	order:pleasant Colure: Brown
pH	8	7.8
%free alkali content	0.22	0.25
Foamability	6cm	5cm
Moisture content	3.25	3.00
Alcohol insoluble matter	17.00	17.50

### Conclusion

The present work focuses on the potential of herbal extracts from cosmetic purposes.

The uses of cosmetic have been increased in many folds in personal care system.

The use of bioactive ingredients in cosmetic influence biological functions of skins and provide nutrients necessary for the healthy skin.

The prepared formulations showed good spreadability, no evidence of phase separation and good consistency during the study period.

Stabilityparameters like visual appearance, nature variation during the study period showed that there was no significant changes during study period.

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