



# FORMULATION AND EVALUATION OF HERBAL ANTIFUNGAL LOTION BY USING *LEUCAS ASPERA* LEAVES EXTRACT

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**Abstract:** Herbal medicine also known as herbalism or phytotherapy is a type of alternative medicine that uses plant extract, herbal, and other natural substances to prevent and treat various health conditions. It is one of the oldest forms of medicine and has been used by different cultures around the world for thousands of years. The ultimate aim of this study is to formulate and evaluate the herbal lotion using herbal extracts of plants having ethnic and dermatological importance in Ayurveda, namely, *Leucas aspera*, and *Ocimum tenifloram*. In the current scenario in cosmetics, the use of herbal antifungal lotion containing natural ingredients are more acceptable in public belief. In the formulation we utilize Tulsi leaves extract, Aloe Vera gel, Rose water, and *Leucas aspera* leaves extract which are not yet used by any other research work. The plant leaves contain active ingredients that have pharmacological effect on the body and can be used for different purposes. It has various pharmacological activities like antifungal, antioxidant, antitoxic, and antimicrobial activity.

**Index Terms:** *Leucas aspera*, Antifungal Activity, Antimicrobial Activity, Antifungal Herbal Lotion, Phytochemical Screening, *Staphylococcus Aureus*, *Escherichia Coli*.

## INTRODUCTION

India has an extensive forest cover amended with plant diversity. Although hundreds of plant species have experimented for pharmacological properties, there are many plants still not been evaluated. Plants have the large-scale asset of being the most effective and cheaper alternative source of medicine. Medicinal plant extracts have been used conventionally to cure various infectious diseases caused by bacteria and fungi. The medicinal properties of plants have been extensively investigated, due to their strong pharmacological activities, low toxicity and economic feasibility. *Leucas aspera* is widely used to cure many diseased conditions, which connote that *L. aspera* has an infinite capacity for the discovery of new drugs.

## Herbal Lotion

The physicians have a wide choice for treatment from solid dosage preparation to semisolid dosage preparation and to liquid dosage formulation. Among the topical formulation, clear lotions have widely accepted in both cosmetics and pharmaceuticals. Since the Vedic era humans use medicinal plants material for to cure any disease or to give a satisfactory treatment against that disease. From this it shows that the importance plant or a part of herbal medicine. The function of a skin lotion is too opposed to skin against different environmental condition, weather and gives soothing effect to the skin. Herbal Lotions are usually applied without friction. The insoluble matter should be finely split as patches approaching colloidal confines are more soothing to inflamed areas and are more effective in contact with infected shells. A wide variety of constituents may be added to the medication to produce greater dispersion or to accentuate the cooling, soothing, drying, or protective properties of the lotion.

## Fungal Infection

The purpose of the current study is also grounded on the medicinal property of a plant. Fungal infection of the skin is currently one of the common dermatological problems. Fungal infections, or mycosis, are conditions caused by a fungus. Fungal infections are most common on your skin or nails, but fungi can also cause infections in your mouth, throat, lungs, urinary tract and many other parts of body. Fungi are living effects that are classified independently from plants or animals.

They move around by spreading out or sending spores into the air or environment. Many fungi live naturally in our body but can overgrow under certain circumstances.



Candidiasis (yeast infection)  
Ringworm (tinea corporis)

Athlete's foot (tinea pedis)



Dermatophytosis

Tinea versicolor (pityriasis versicolor)

**Fig.1: Type of Fungal Infectious**

## Herbal Plant

*Leucas aspera* is one of the herbs found momentous due to its overriding medicinal outcomes. *L. aspera*, a species within the *Leucas* genus and the *Lamiaceae* family, is an aromatic herb widely distributed in tropical South Asia (India, Bangladesh, and Nepal), Malaysia, Mauritius, and Africa and grows as a competitive weed in upland crop fields, spreads, free lands and roadsides.

Many phytochemicals belong to the classes of terpenes, terpenoids, sterols and fatty compounds, glycosides, long-chain compounds, flavonoids, lignans, alkaloids and others were identified and isolated by different extraction methods. These extracts were being delved for their natural conditioning similar as antimicrobial, antioxidant, anticancer, phytotoxic, antivenom, thrombolysis, hepatoprotective, anti-inflammatory, analgesic, antinociceptive, antiulcer, antimalarial, antipyretic and antidiabetic activity.



**Fig. 2: *Leucas aspera***

- **Taxonomical Classification**

Kingdom: Plantae  
 Subkingdom: Tracheophyta  
 Division: Angiosperma  
 Class: Dicotyledonae  
 Order: Lamiales  
 Family: Lamiaceae  
 Genus: *Leucas*  
 Species: *Aspera*

- **Other Names**

Sanskrit: Dronapushpi  
 Punjabi: Guldora  
 Bengali: Darunaphula, Hulkasha  
 Gujarati: Kulnphul  
 Hindi: Goma madhupati  
 Sindhi: Kubo  
 Marathi: Tumba

- **Description**

*Leucas aspera* is an annual plant with branches, stem, flowers, and leaves. Herbs height is 15-60 cm with stout and hispid acutely quadrangular stems and branches. Leaves are sub-sessile, linear, blunt, narrowed at the base. They can reach up to lengths of 8 cm, and be 1.25 cm broad. The length of petioles is typically 2.5–6 mm long. The leaves epidermis is covered in a thick waxy cuticle and is traversed with stomata, with entire periphery long extensively distributed throughout the India. Traditionally, *L. aspera* has been used for coughs, cold, painful lump, and in habitual skin eruptions.

- **Phytochemical Screening**

The plant exhibits different pharmacological activities such as antifungal, antioxidant, and antimicrobial, prostaglandin inhibitory, anti-nociceptive and cytotoxic activity in the *L. aspera* plant. The active phytochemical elements of plant as glycosides, tannins, saponins, sterols, oleic acid, linoleic acid, linolenic acid, palmitic acid, stearic acid, oleanolic acid, ursolic acid and nicotine have already been isolated from the leaves, roots, flower and seeds of this plant. The plant is used traditionally as an antipyretic and germicide. Leaves are considered useful in habitual rheumatism, psoriasis and other habitual skin eruptions. The leaves are applied to the bites of serpents, poisonous insects, and scorpion sting.

- **Anti-Fungal Test**

The term "anti-fungal activity" refers to all active principles (agents) that are capable of preventing the development of fungal growth, inhibiting the growth of fungi, and even destroying them. The process of killing or suppressing disease-causing fungus is referred to as anti-fungal activity. *In vitro* study of *Leucas aspera* with solvent chloroform and ether extracts has greater activity. It has antifungal activity against *Trichophyton* and *Microsporum gypseum*. The minimum inhibitory concentration was set up to be 5mg/mL. *Leucas aspera* had shown both the fungistatic and fungicidal actions.

## MATERIALS AND METHODS:

1. **A Collection, Drying of Plant Material:** The leaves were collected from the plant then they dried in shade, coarsely powdered get formed after crushing with hand. The dried powder stored in well-stoppered container. The dried material of *Leucas aspera* was then used further work.
2. **Material:** Mature plants of *Leucas aspera* leaves were used for this preparation and were collected. The analytical balance was used for weighed *Leucas aspera* powder. Sieve was used for separate fine particles from *Leucas aspera* powder. Heater Mantle was used for heating the solution during Soxhlet extraction time. Soxhlet chamber was used for the extraction process. Round bottom flasks and measuring cylinder were used for measuring solvent.
3. **Method for extraction of *Leucas aspera* extract:** Preparation of plant extract 20g of powdered leaves were extracted successively with 100ml of methanol at 40-50°C in Soxhlet extractor until the extract was clear. The extracts were evaporated by heating until the dried resulting pasty form extracts were stored in a refrigerator at 4°C.
4. **Formulation of Herbal Lotion**
  - The stearic acid and other oil soluble components Cetyl alcohol, lanoline was dissolved as the oil phase (Part A) by heated up to 75° C.
  - The preservatives and other water-soluble components Methyl paraben, Triethanolamine, glycerol, rose water, aloe vera gel was dissolved as the aqueous phase (Part B) and heated up to 75° C.
  - After heating, oil phase was added in portions to the aqueous phase with continuous stirring until homogeneous lotion is formed.
  - The Tulsi and *Leucas aspera* cold extract is taken and levigates in geometric proportion form a homogeneous lotion.
  - Required amount of water added in the lotion and mix homogeneously
  - Then lastly add required amount of Sandalwood oil as a fragrance.
  - Stored in well closed container and labelled it.



Fig.3- Soxhlet extractor for *Leucas aspera*

Table 1: Formulation of Lotion

Sr. No	Ingredients	Quantities (gm)				Uses
		F1	F2	F3	F4	
1.	Leucas aspera extract	1ml	2ml	3ml	4ml	Anti-Fungal Activity
2.	Tulsi extract	1ml	1.5ml	2ml	2.5ml	Anti-Microbial Activity
3.	Steric acid	1gm	1.5gm	1.5gm	2gm	Lubricating Agent, Emulsifier
4.	Cetyl alcohol	0.20g m	0.25g m	0.10g m	0.30gm	Moisturizer
5.	Lanoline	0.3gm	0.4gm	0.5gm	0.6gm	Emollient
6.	Methyl Paraben	0.05g m	0.05g m	0.05g m	0.05gm	Preservative
7.	Glycerol	7ml	6ml	4ml	3ml	Softening agent
8.	Triethanolamine	0.3ml	0.3ml	0.35m l	0.4ml	Surface-active Agent
9.	Rose water	2ml	2ml	1.5ml	1.5ml	Skin-Whitening Agent
10.	Aloe Vera gel	1ml	1ml	1ml	1ml	Anti-oxidant
11.	Sandalwood oil	1ml	1ml	1ml	1ml	Fragrance
12.	Water	q.s	q.s	q.s	q.s	Vehicle

#### 5. Evaluation of Herbal Lotion:

Prepared formulation of Herbal Lotion was subjected to following evaluation parameters:

- Organoleptic Evaluation:** Parameters like colour, odour, texture was carried out, Colour and texture were evaluated by visual and touch sensation respectively. The formulation was sensed in order to examine the odour.
- Appearance and Homogeneity:** It was estimated by visual examination.
- Wash ability:** Formulations were applied on the skin and then ease and extent of washing with water were checked manually.
- PH:** PH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant Temperature.
- Ease of Removal:** The ease of removal of the lotion applied was examined by washing the applied part with tap water.
- Viscosity:** The viscosity of Herbal Lotion was determined by using Ostwald viscometer.
- Spread ability test:** 0.1g Sample was applied between two glass slides and was compressed to uniform thickness by placing 100gm weight for 5minutes. Weight was added to the pan. The Spread ability was calculated by using radius of circle formed by compressed slide.
- Stability:** *Leucas aspera* Herbal Lotion formulation stability studies were conducted by storing it at different temperatures such as 40°C, 25°C, and 37°C for one week. During the stability tests, no colour change or phase separation was noticed in the prepared Lotion.
- Skin Irritation Test:** The Skin Irritation Test was performed by applying Herbal lotion to the skin and leaving it for 30 minutes. After 30 minutes, examine the skin for any itching, rashes, or redness using sensory and visual inspection.
- Antimicrobial testing of the prepared formulations:**  
The screening of antibacterial activity of the extracts against pathogens was performed using disc diffusion method. Nutrient agar media was prepared, sterilized and aseptically spread on four sets of Petriplates which were previously marked as formulation coding. Microorganisms used were *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Escherichia coli*. The plates were inoculated with microorganism suspension and incubated at 37°C for 24h. Next day filter paper discs loaded with alcohol based herbal lotion and synthetic lotions were placed in the respectively marked plates. It was taken care

that the sterile discs fully absorb the expression. After 24 h test results were observed to determine the efficacy of phrasings in terms of zone of inhibition of microorganism. Advanced the zone of inhibition, the more effective is the test formulation.

### III.RESULT:

All the observation data for evaluation of *Leucas aspera* leaves presented as following Table.

**Table 2: Preliminary phytochemical screening**

S.N	Phytoconstituents	Results
1.	Steroids	-
2.	Phenolic compounds	++
3.	Reducing sugars	+
4.	Flavonoids	++
5.	Glycosides	+
6.	Saponins	+
7.	Triterpenoids	+
8.	Alkaloids	+
9.	Anthraquinones	-
10.	Tannins	+++
11.	Quinones	+
12.	Coumarins	-

Above Table 2 of Preliminary phytochemical screening of the *Leucas aspera* leaves extract shows the presences of Phenolic compound, Flavonoid, Glycosides, Saponins, Triterpenoids, Alkaloid, Tannins, and Quinones.

**Evaluation Parameters:** The prepared formulations *Leucas Aspera* lotion were subjected to physical evaluation and other evaluation parameters.

**Table 3: Evaluation Parameter**

EVALUATION PARAMETER	F1	F2	F3	F4
Color	Green	Green	Green	Green
Odour	Sandalwood	Sandalwood	Sandalwood	Sandalwood
Dilution	O/W	O/W	O/W	O/W
Appearance	Smooth	Smooth	Smooth	Smooth
Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous
Grittiness	Non gritty	Non gritty	Non gritty	Non gritty
Skin Irritation Test	No irritation	No irritation	No irritation	No irritation
PH	5.5	5.8	6.1	6.4
Spreadability	7.0cm	7.2cm	7.3cm	7.8cm
Viscosity	24137 cps	21243 cps	23773 cps	22732 cps
Stability (37 <sup>0</sup> C)	Stable	Stable	Stable	Stable
Type of smear	Non-greasy	Non-greasy	Non-greasy	Non-greasy
Emolliency	No residue left	No residue left	No residue left	No residue left

**FIG. 4: Formulated Herbal Lotion****Table 4: Results of zone of inhibition using Herbal Lotion.**

PATHOGENS	10µl	20µl	30µl
<i>Escherichia coli</i>	3.7mm	5.1mm	8.2mm
<i>Pseudomonas aeruginosa</i>	12.2mm	15.3mm	18.5mm
<i>Staphylococcus aureus</i>	9.3mm	11mm	14.2mm

## CONCLUSION:

It can be concluded that it is possible to develop lotion with herbal extract. *Leucas aspera* in traditional Indian medicine and this are the antifungal activities show that the leaf extract of this plant can be used. This are formulated from the preparation of lotion *leucas aspera* are effective in their mode of action and less side effect. This are various phytochemicals including alkaloids, phytosteroids, flavonoids, saponins, phenols and glycoside. In the present study *leucas aspera* leaf have shown antifungal activity. The leaf can be used as herbal antifungal lotion that is caused by fungi and bacteria. *Leucas aspera* is an important medicinal plant. It is easily available in road side, it is less cost effective lotion can be used for the various antifungal infection. Different chemical and physicals test of lotion it showed that to protect the skin infection caused by fungus or bacteria. The formulation of herbal antifungal lotion was done by incorporating the extract of *Leucas aspera* and water in oil emulsion method was prepared. The herbal antifungal lotion gave smooth on application which was maintained after tested stability study. Further this plant can be used in the formulation of mosquito repellent, soap, and cream.

## ACKNOWLEDGMENT

The authors would like to express their heartfelt appreciation to my parents and my regarded, respected guide, Ms. Sampada Shrawankar Mam of GCOP, for his supervision, advice, and direction in providing encouragement and facilities for assembling this work.

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