

# Formulation and evaluation of Polyherbal antifungal cream

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**Abstract-** The remedies used to improve a person's look are called herbal cosmetics. The purpose of the current study was to create a herbal cream that would moisturise, nourish, lighten, and Treatment of different skin conditions. Various crude medications were used, including Cedro Oil (lemon peel), Myristica fragrans (nutmeg seeds), Olium rosae (rose oil), Prunus dulcis (almond oil), Ocimum Sanctum (tulsi leaves), Azadirachta Indica (neem leaves), and Curcuma longa (turmeric rhizomes). Two final samples underwent accelerated stability testing in an environmental chamber with a temperature of  $25 \pm 10^\circ\text{C}$  and a humidity of  $60 \pm 10\%$  RH. It was discovered that every product was stable, showing no evidence of phase separation or colour changes. There is no indication of skin irritation or allergy symptoms based on the results of the patch test for sensitivity testing. The evaluation of the microbiological quality of prepared cosmetics is the primary objective of this investigation. To everyone's amazement, both formulations passed the microbiological limit tests according to international standards. Consequently, it has been established that the formulation of herbal cosmetics is safe to use and can be applied as a barrier to protect skin.

**Key words:** Polyherbal cream, Lawsonia inermis, Azardiracta indica, Curcuma longa.

## 1.INTRODUCTION:

Cosmetics and beauty are as old as civilization and humanity itself. Indian plants are well-known over the world for their various uses. Herbal cosmetics are a priceless gift from nature that are in high demand on the global market. Since herbal formulations have good activity and almost no adverse effects when compared to synthetic drugs, they have traditionally garnered a lot of attention. Because they contain herbal ingredients, herbal cosmetics are classified as beauty products with desired physiological activities, such as healing, smoothing look, enhancing, and conditioning qualities. These days, the benefits of herbs ,Herbal cosmetics are in high demand, and the manufacturing of cosmeceuticals has grown significantly in the personal care system. Cosmetics are substances that are administered topically to the human body with the intention of cleansing, beautifying, enhancing attractiveness, and changing appearance without compromising the body's natural functions or structure. However, using synthetic chemicals for an extended period of time harms both our environment and young people.

Numerous artificial substances, chemicals, dyes, and their derivatives have been shown to induce a wide range of skin conditions with a multitude of adverse effects.As a result, we make extensive use of herbal cosmetics. The fundamental principles of skin care cosmetics are deeply ingrained in the medical systems of Unani, Ayurveda, Yajurveda, Rig-Veda, and Homoeopathy. These are the goods that herbs can be used raw or extracted. These herbs ought to possess a wide range of qualities, such as antibacterial, anti-inflammatory, antiseptic, emollient, anti-seborrathic, and antikerolytic action.[5]

Cosmetics are made to combat acne, lessen wrinkles, and regulate oil production. Formulations such as skin protection, sunscreen, antiacne, antiwrinkle, and antiaging are made with a variety of materials, both synthetic and natural, to address different kinds of skin conditions.

Tulsi oil is one of the several herbs used in the production of Cream. The herbs that have been chosen have been chosen using both a scientific rationale and a traditional system with contemporary applications. A herbal cream that, when applied consistently, can provide skin with adequate protection and is free of any toxicity, toxic residue, or irritation; it should also be acceptable from a cosmetic standpoint.

One of the oldest and most widely used forms of medicine is herbal medicine.

Recently, there has been progress in the delivery of herbal drugs with the goal of effectively managing human ailments. The World Health Organisation (WHO) projects that eighty percent of the Currently, herbal medicine is used for primary healthcare by populations worldwide. Every country is looking for healthcare outside of the confines of contemporary medicine and using herbal treatments as a form of self-medication. 1. Scientific proof of herbal medicine, clinical experience, traditional knowledge, and knowledge of medical science are the foundations of modern herbal medicine. Individuals are gradually moving towards complementary and alternative medicine.[2]

**Benefits of the herbal medicine system include:**

- A reduced chance of adverse consequences
- Widespread accessibility
- Performance in managing chronic illnesses
- Herbal medicine effectively enhances the body's natural detoxification process, making them all the more tempting due to their low cost effectiveness.

**The drawbacks of the herbal medicine method**

- Large doses
- Unstable in more acidic environments; hepatic metabolism, etc.
- A large molecule size that prevents passive diffusion absorption.
- A significant quantity of raw materials is needed to process the medication.
- A partial or complete loss of medicinal efficacy results from the separation and purification of particular components from the overall herbal extract.

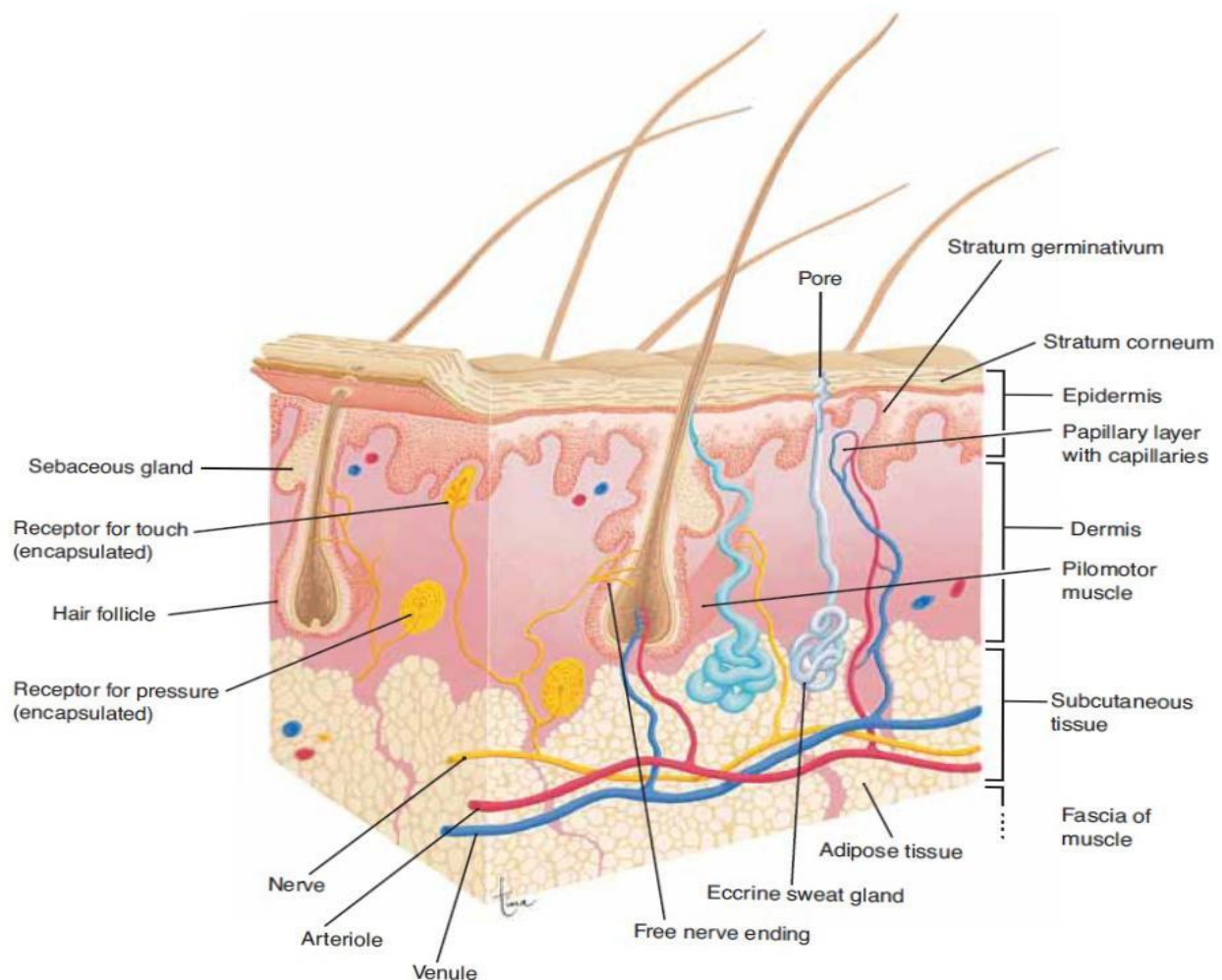
These restrictions result in a lower therapeutic index for the active ingredients in plants due to decreased bioavailability. Natural synergy frequently disappears, which is caused by chemically related components found in herbal extract. Therefore, the development of a unique drug delivery mechanism for herbal drugs has received a lot of attention.[5]

**Skin function in a normal state.**

Three layers make up the skin:

- dermis (1-2 mm)
- epidermis (50-100  $\mu\text{m}$ ).
- Hypodermis (1-2 millimetres)

**Fig. 1: The anatomical layers of the cutaneous tissue.**



The stratum corneum, the outermost layer of the epidermis, is the barrier to percutaneous absorption. The stratum corneum serves as a permeability barrier, minimises water loss, and offers defence against microbes and abrasive action. An obstruction to the surroundings.

A layer of flat, polyhedral-shaped, 2–3 µm thick, non-nucleated cells called corneocytes makes up the 10–20 µm thick stratum corneum. The main component of corneocytes is insoluble bundled keratin, which is encased in a cell envelope stabilised by cross-linked proteins and lipids covalently bonded. Membrane connections known as corneodesmosomes link corneocytes and support the cohesiveness of the stratum corneum. Lipids derived mostly from lamellar body exocytosis during keratinocyte terminal differentiation make up the intercellular gap between corneocytes. An effective skin barrier function depends on these lipids.[6]

There are 10–20 layers of cells that make up the epidermis. Melanocytes, which are involved in skin colouring, and Langerhans' cells, which are involved in antigen presentation and immunological responses, are also found in this pluristratified epithelium. Like any other epithelium, the epidermis gets its dermal vascular network's nutrients. The stratum corneum regenerates dynamically, and intricate regulatory mechanisms of cellular differentiation govern this process. The epidermal responses to disruptions of the skin barrier, such as: (i) extraction of skin lipids with a polar solvent; (ii) physical removal of the stratum corneum with adhesive tape; and (iii) chemically-induced irritation, have provided us with our current understanding of the stratum corneum's function.[9]

### **Fungi:**

"Fungi are a kingdom of heterotrophic, usually multicellular, eukaryotic organisms that play a significant role in the cycling of nutrients within an ecosystem."

### **Features of the fungus**

While some fungi have many cells, others are single-celled. Yeasts are single-celled fungus. Certain fungi switch between single-celled and multicellular forms based on which life cycle stage they are in. Similar to plant and animal cells, fungal cells are composed of organelles and a nucleus. Chitin, a hard material also present in the exoskeletons of insects and other arthropods like crustaceans, is present in the cell walls of fungi.

The common component of plant cell walls, cellulose, is absent from them. Multicellular fungi have a large number of branching filaments called hyphae. Hyphae are tubular in shape and have septa, or walls, dividing them into sections that resemble cells. These cells are capable of having several nuclei. And other organelles, including nuclei, can travel between them. A mycelium is a network of hyphae found in fungi.[8]

### **Types of Fungi**

- Chytridiomycota
- Zygomycota
- Glomeromycota
- Ascomycota

**Chytridiomycota:** The creatures that make up the Chytridiomycota family, known as chytrids, are mostly asexual and use tiny appendages resembling tails to create spores. It can burrow under frogs' skin and infect them with fungus.

**Zygomycota:** The majority of these are terrestrial. They grow on human tissues and cause problems.

Ex: A bread mould called *Rhizopus stolonifer*.

**Glomeromycota:** Soil contains them. After taking sugar from the plant, the fungi breakdown the minerals in the soil to give the plant nutrition. This fungus reproduces asexually as well.

**Ascomycota:** These are the pathogens that affect both plants and animals, including people. They can cause infections like ringworm, athlete's foot, and ergotism, which can result in hallucinations, vomiting, and convulsions and occasionally even demise.[8]

### **Fungal infection:**

Fungal infection is defined as an inflammatory disease brought on by a fungus. Mycosis. In medicine, zymosis refers to the emergence and dissemination of an infectious disease, particularly one that is fungal in nature.

Any of the several skin or mucous membrane illnesses brought on by blastomycosis is known as blastomycosis.

### **Kind of fungus infection:**

1. Superficial: skin – mucous membrane impacted. Examples of fungi that damage the keratin layer of skin, hair, and nails are tinea versicolor dermatophytes. Such as ringworm infection and tinea pedis

Candidiasis: nail infections, vulvo-vaginitis, oral thrush, and yeast-like symptoms.

2. Deep infections: impact the heart, brain, lungs, and cause pneumonia, endocarditis, and meningitis.[10]

### **Overview of Fungal Skin Infections:**

Typically, fungi live in moist places on the body where skin surfaces contact, such as under the breasts, in the vaginal area, and between the toes. Typical fungal skin diseases are caused by dermatophytes like *Epidermophyton*, *Microsporum*, and *Trichophyton*, or yeasts like *Candida* or *Malassezia furfur*. Many of these fungi are restricted to the stratum corneum, the outermost layer of the epidermis, and do not grow deeper.

Due to their large number of skinfolds, obese individuals are more susceptible to these illnesses, particularly if the skin inside a skinfold becomes inflamed and deteriorated (intertrigo). Individuals with diabetes typically. Additionally more

vulnerable to fungal infections. It's odd that rashes on non-infected body parts might result from fungal infections in one area of the body. For instance, a rash that is itchy and bumpy on the fingers may result from a fungal infection on the foot.[7]

These eruptions, also known as identification or id responses or dermatophytids, are caused by an allergy to the fungus. They don't happen when you touch the affected area.



**Fig. 2: Fungal skin infection.**

#### **Symptoms:**

- Skin changes such as redness and possible peeling or cracking
- itching

**Causes of fungal skin infection:** The following factors contribute to bacterial imbalance:

- As a result of taking antibiotics
- A hormone imbalance
- Improper eating habits

**Diagnosis:** When a rash appears in one of the often affected locations and is red, inflamed, or scaly, doctors may suspect a fungal infection. A little piece of skin can be scraped off, inspected under a microscope, or placed in a culture medium where the particular fungus can grow and be identified in order to confirm the diagnosis of a fungal skin infection.[5]

#### **Treatment:**

- Antifungal medications
- Steps taken to keep moisture out Antifungal medications are commonly used to treat fungal infections. These medications are usually used topically, or on the diseased area. Shampoos, gels, lotions, creams, and solutions are examples of topical medications. Antifungal medications can also be ingested orally. Apart from medication, individuals may employ techniques like powder application or open-toed shoe wear to maintain dryness in the afflicted areas.
- To reduce inflammation and irritation caused by certain infections, physicians prescribe corticosteroids.

#### **Cream:**

Definition: "A cream is a semisolid drug preparation with a water base that is applied topically to the skin. In essence, it is the preparation of oil in water, usually petrolatum or lanolin. "An ointment is topical application preparation." [9]

**Antifungal cream:** "Cream intended to eradicate fungi or stop their growth"

#### **The benefits of cream include:**

- reducing inflammation;
- improving skin tone;
- preventing wrinkles and acne;
- boosting blood circulation and cell metabolism;
- being easily water washable.
- Simple to remove.
- It is easier to apply and spread on the skin's surface than ointment. It is also less oily.
- Ideal for fair, dry, and sensitive skin types.
- Ideal for recent wounds

#### **The disadvantages of cream include:**

- A lower level of stability compared to ointment
- A higher risk of contamination due to their lower hygroscopicity compared to other semi-solid preparations.
- Diffuse compared to alternative semi-solid preparations.

## 2. REVIEW OF LITERATURE:

1. From October 2014 to March 2015, A. Premkumar, T. Muthukumaran, V. Ganesan, Shanmugam R., and Priyanka D. L. This study includes the following: A new cream formulation containing hydrocortisone, mupirocil, and miconazole nitrate was created. Diffusion experiments were conducted in vitro on the formulation. Studies on microbes and in-vivo skin irritation were carried out to determine the safety of the ingredients utilised in the formulation. It was discovered that the produced cream, which combined hydrocortisone, miconazole nitrate, and piropropionicol, was both safe and effective in treating skin infections.

2. Sumit Kumar Sahoo & Amulyaratna Behera – (Jun 2012). This study includes the following: Methanol/dichloromethane(2:1) was used in the solvent evaporation process to create GB-loded PLGA NPs, which were then characterised using transmission electron microscopy. Differential scanning calorimetry (DSC) and microscopy (TEM). It was also investigated how drug:polymer ratios of 1:1, 1:2, 1:3, and 2:1, as well as string speed (250, 1000, 1500, and 2500 rpm), affected particle size, size distribution, zeta potential, drug loading, encapsulation efficiency, and drug release. TEM and DSC studies, respectively, show that stable NPS were effectively generated without any incompatibility. Particle size, drug loading, and encapsulation efficiency all improved along with the polymer and drug concentrations and stirring speed. Drug release was maintained by an increase in polymer concentration, but as drug concentration rose, the opposite happened.

3. Somishwar S. Khadbadi, Ashwini S. Dhase, and Shweta S. Sahoo (2014). This study report is composed of: The current study's goal was to create and assess a herbal cream that would disappear. Compared to other creams, herbal creams provide a number of advantages. Most creams on the market today are made from synthetic drugs like acyclovir, triamcinolone, calcipotriene, mometasone, and extracts, which make the face more fair, but they also have a number of negative side effects including itching or allergic reactions. Creams with herbs don't Have any of these negative consequences; when they don't, skin appears more fair.

**3. AIM:** To create and assess a cream with antifungal properties using natural ingredients

### OBJECTIVE:

- 1) The goal of this research project was to create a cream that has no negative reactions or side effects.
- 2) To investigate the safety and effectiveness of prepared antifungal cream.

**PHYTOCHEMISTRY OF HERBAL DRUG:** Herbal ingredient used: Tulsi Oil



**Synonyms:** Sacred basil, Kali-Tulsi, Veranda

**Biological source:** Tulsi consists of the fresh and dried leaves of *Ocimum* species like *Ocimum sanctum* L. and *Ocimum basilicum* L.

**Family:** Lamiaceae.

### Macroscopical characters

-Green type of *Ocimum sanctum* oblique Petiolate, oppose, and stipulate. The petiole measures 2.6 to 3.1 cm in length and is thin, slender, and glabrous. The lamina is elliptical to ovoid, oblong, and measures 5 to 6 cm in length and 2.6 to 3.2 cm in width.

-Margin: Complete, erratically wavy, or sharply serrate.

-Apex: Sharp or oblique

-Adaxial surface : Vibrant green

-Pale green abaxial surface with noticeable veins.

- Venation: pinnately reticulate, including five to six lateral vein pairs that alternate.

-Aromatic smell.

-Scent: Strong.[4]

### 3.Purple type of *Ocimum sanctum* leaves

(i) Petiolate, opposite, and exstipulate.

(ii) Petiole: green with a hint of purplish colour, 3.6 cm long, thin, less pubescent, and with a little, barely noticeable adaxial groove.

(iii) Lamina oblong to elliptic, 5–8 cm long, 2.6–3.6 cm wide.

(iv) Margin: Slightly or slightly jagged.

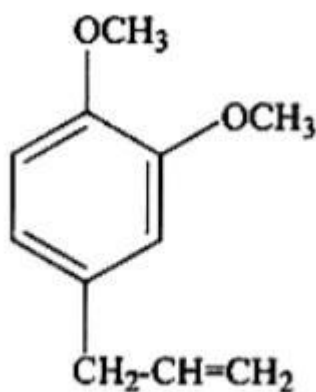
(v) Apex: acute or obtuse, mostly glabrous save for the veins, aromatic and pungent in flavour; veins pinnately reticulate, with 5-7 lateral pairs of veins; the veins are conspicuous on both surfaces, with the adaxial side being dark green and the abaxial side dull green.

(vi) Aromatic smell.

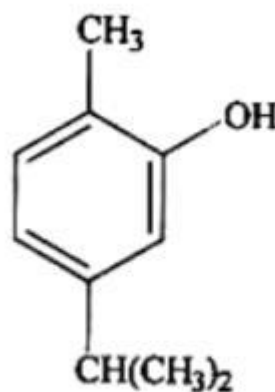
(vii) Strong flavour.

#### Chemical Constituents: Volatile oil (0.8%):

- i. Eugenol, nerol, eugenol methyl ether,
- ii. Caryophyllene, terpinene-4-ol-decylaldehyde,
- iii. A-selinene,  $\alpha$  and  $\beta$ -pinene,
- iv. Camphor and carvacrol
- v. Cineole, linalool.



Methyl eugenol



Carvacrol

#### Uses

1. Expectorant
2. bronchitis
3. Refrigerant.
4. Stomachic.
5. Antifertility agent.
6. Carminative.
7. Spasmolytic Property.
8. Stimulant
9. Antifungal.[6]

5) **Excipient Profile:** In this formulation following ingredients are used and their uses as Follow:

Table no.1: Uses of ingredients.

Sr.No	Ingredient	use
1	Tulsi Oil	Antifungal Agent
2	Petroleum Jelly	Soothing Agent
3	Hard Paraffin	Lubricant
4	Cetyl alcohol	Emollient
5	Glyceryl monostearate	Emulsifier
6	Methyl Paraben	Preservative
7	Propyl Paraben	Preservative
8	Peppermint Water	Fragrance
9	Activated Charcoal	Adsorbent

1. **Petroleum Jelly:** It is a calming agent in this composition.
  - A. It is a semisolid hydrocarbon combination (more than 25 carbons).
  - B. The usual range for its melting point is 400–700 c. It can only catch fire when heated to a liquid state.
  - C. When pure, it has no taste or smell, is translucent, and is colourless or pale yellow in appearance.
  - D. It is not easily affected by chemical agents and does not oxidise when exposed to air.
  - E. It dissolves in organic solvent but is insoluble in water.[8]
2. **Hard Paraffin:** It serves as a lubricant in this composition.
  - a. It is the blend of petroleum-derived solid saturated hydrocarbons.
  - b. Hard paraffin is a white, colourless substance that resembles wax and is made up of a variety of microcrystals.
  - c. Hard paraffin melts between 470 and 650 degrees.
  - d. When solid, it improves the cream base's rheological characteristics.[9]
3. **Cetyl Alcohol:** It serves as an emollient in this composition.
  - a. Other names for it include palmityl alcohol and hexadecan-1-on.
  - b. With the formula  $\text{CH}_3(\text{CH}_2)_{15}\text{OH}$ , it is a fatty alcohol.
  - c. It appears as flakes or a waxy white solid at room temperature.
  - d. Whale oil is the source of the word cetyl, which was initially extracted from it.
  - e. 49.30 °C is its melting point.[8]
4. **Glyceryl Monostearate:** It serves as an emulsifier in this mixture.
  - a. It melts between 570 and 650
  - b. In water, it is insoluble. Known by its common name, GMS, monoglyceride is frequently employed as an emulsifier in food products.
  - c. It is a hygroscopic, white, odourless, and sweet-tasting flaky powder.
  - d. It is the glycerol ester of stearic acid chemically.[8]
5. **Methyl Paraben:** It is employed as a preservative in this formulation.
  - a. The chemical formula of this preservative is  $\text{CH}_3(\text{C}_6\text{H}_4(\text{OH})\text{COO})$ .
  - b. It is p-hydroxybenzoic acid methyl ester.[9]
6. **Propyl Paraben:** It serves as a preservative in the formulation.
  - a. It is an ester of p-hydroxybenzoic acid that is found naturally.
  - b. Despite being synthesised for use in meals, medications, and cosmetics, it is present in a variety of plants and insects.
  - c. It belongs to the paraben class.
  - d. It is a preservative that is commonly present in cream lotions and other water-based cosmetics.[10]
7. **Peppermint water:** This mixture serves as a scent.
  - a. Peppermint oil, which is derived from peppermint plant leaves, is the active component of peppermint water.
  - b. Another name for it is *Mentha piperita* L. c. This herbal remedy has been used traditionally to treat digestive issues like gas, indigestion, and cramping in the stomach.
  - c. It is colourless and transparent.[4]
8. **Activated Charcoal:** In this formulation, it serves as an adsorbent.

- A cream uses it as an adsorbent.
- Its ability to effectively remove toxins from the body gives it antifungal properties.
- It attracts dirt, chemicals, poison, bacteria, and other microscopic particles to the skin's surface, aiding in the creation of a flawless complexion and combating acne.
- It can be used to treat some toxic bites and disinfect some wounds, but it is not metabolised or absorbed by the body.[4]

## 6. EXPERIMENTAL WORK

### Formulation preparation

Table 2 indicated the formulation ingredients that were used. A 20–60% oil in water emulsion of medications was created. In the oil phase (Part A), the emulsifier (glycerol monostearate) and other oil-soluble ingredients (petroleum jelly, cetyl alcohol) were dissolved. Heated to a temperature of 80°C. Heat was applied to (Part B) until the extract and water soluble components (propyl and methyl paraben) were dissolved.

Following heating, the aqueous phase was gradually added to the oil phase while stirring continuously to create a cream. The resulting cream had an excellent lemon yellow colour.

When the temperature dropped to 45 °C ± 50 °C, perfume was added.[4]

**Table no. 2: Composition of Cream.**

Sr.No.	Ingredient	Composition
1	Tulsi Oil	6ml
2	Petroleum Gelly	12.9gm
3	Hard Paraffin	6gm
4	Cetyl Alcohol	1.5ml
5	Glyceryl Monosterate	1.5gm
6	Methyl Paraben	1.2gm
7	Propyl Paraben	0.9gm
8	Peppermint Water	q.s
9	Activated Charcoal	0.03gm

### 7) Evaluation of Cream:

1) **Physical Properties:**The Cream's hue, smell, and look were noted.

**Table 3: Physical Property.**

Sr.No	Properties	Observation
1	Colour	Pale Yellow
2	Odour	Characteristic
3	Appearance	Semi-Solid

2) **Stability studies-** Drug products are subjected to stability testing from the start of drug research until the chemical or commercial product fails. According to ICH recommendations, stability studies were conducted to evaluate the medication and formulation stability. The ICH guidelines were followed in conducting the stability investigations. After being put into a bottle, the cream was held in a humidity chamber with two different settings for a month: 30 ± 2°C/65 ± 5% RH and 40 ± 2°C/75 ± 5% RH. Viscosity and physical characteristics of the samples were examined at the conclusion of the studies.[8], [9]

Table 4: Stability Test.

Test	After one month
Physical appearance	Semi-solid
Texture	Smooth and creamy
Colour	Pale yellow
Odour	Characteristic
PH value	6.1
Thermal stability	Stable
Degradation of product	No

3) **Determination of pH:** A precise weight of  $0.5 \pm 0.01$ g of the Cream was measured in a 10ml test container. The cream was added and mixed with 4.5 ml of water. Using the pH metre, the suspension's pH was calculated at 27°C.[6]

Sr. No.	Test	Obsrevation
1	PH(at $27^{\circ}\text{C} \pm 2^{\circ}\text{C}$ )	6

Table 5: PH Test.

**1.Patch Test :** The item to be tested, weighing between one and three grammes, was applied to the skin's most sensitive area—the area behind the ears, for example—using a piece of cloth or a funnel. One square metre of skin was covered with the cosmetic that was going to be evaluated. Additionally, control patches were used.

After a day, the patch location is inspected.[6]

**Result:** No any inflammation or irritation to the skin.

**Spreadability Test:** The ability of semisolids to disperse well is a crucial need. "The term spreadability refers to the area that the cream readily spreads to when applied to the skin." The effectiveness of a therapy Formulation is also influenced by how well it spreads. A specialised tool has been developed to investigate the formulations' spreadability. Spreadability is defined as the "time in seconds" it takes for two slides that are positioned in the middle of the formulation to separate when a specific force is applied. Better the spreadability, the shorter the time required to separate the two.

Two standard-sized glass slides were chosen. Over one of the slides was the formulation, the spreadability of which was to be determined. The second slide was positioned above the formulations and tucked in between the two slides along the 5 cm length of the slide. In order to press the formulation evenly between the two slides and create a thin layer, a 10 g weight was added to the upper slide. The extra formulation sticking to the slides was scraped off once the weight was removed. The formulation was placed on one of the fixed slides.

The second movable slide was positioned on top of it, and one end of It was fastened to a string so that a pan and a basic pulley could apply load. The time it took for the upper slide to move 5.0 cm after a 3g weight was placed on It was observed that the weight caused the separation from the lower slide. Next, the spreadability was determined using the following formula:[6]

$$\text{Spreadability} = m \times l / t$$

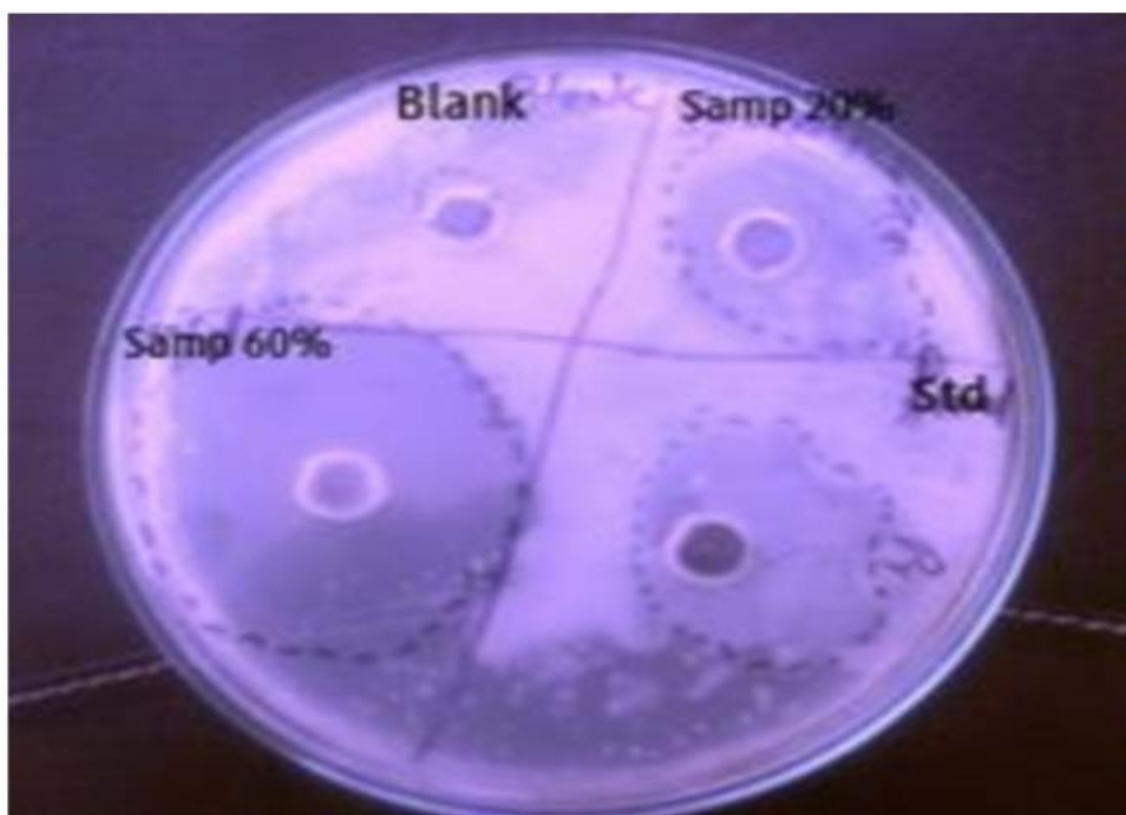
Where, m = weight tied to the upper slide (3g) l = length of glass slide (5cm)

T =time taken in seconds

**Table 6: Spreadability Test.**

Formulation	Time(In sec)	Spreadability(g.cm/sec)
Antifungal cream	1.5	10

**6) Test for microbial growth in formulated creams:** Using the streak plate method, the prepared creams were inoculated into agar medium plates, and a control was created by leaving out the cream. After being put in the incubator, the plates are being incubated at 37 °C for 24 hours. Plates were removed from the incubator after the incubation period to assess the microbial growth by contrasting it with the control.[10]



**Fig.4: Microbial test.**

**RESULT AND DISCUSSION:** A majority of the world's population in developing countries still relies on herbal medicine to Meet its health needs and because of this extensive research is now being carried out in this Area.

- After two weeks of the study period, stability assessments of the various characteristics, such as the formulations' visual appearance, nature, and pH, revealed no significant variation. The findings are compiled in Table No. 4.
- The extracted cream's pH of about 6 was discovered to be appropriate for topical application, as the pH of skin ranges from 4.5 to 6. The findings are compiled in Table No. 5.
- Patch Test investigations on the cream's formulation reveal no signs of redness, edema, inflammation, or irritation. It is safe to use these formulations on skin.
- The formulation has improved spreadability, according to the spreadability studies. Table No. 6 presents a summary of the spreadability and pH findings.
- By cultivating the creams on agar media, harmful bacteria were detected in the formulations. (Fig. no. 4) After a 24-hour incubation period at 37°C, no evidence of microbial growth were observed, and the material exhibited greater antifungal properties than normal.

## 8.CONCLUSION:

The potential of plant extracts for cosmetic applications is the main focus of the current study. The personal care system now uses cosmetics on a much larger scale. The application of bioactive substances in cosmetics affects the skin's biological processes and supplies nutrients.

Essential to having good skin. Throughout the course of the investigation, the produced formulations demonstrated high consistency, good spreadability, and no signs of phase separation. Stability measures such as the formulations' visual appearance, degree of fluctuation during the research period, and aroma revealed no appreciable alterations.

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