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# Formulation and Evaluation of Herbal Antifungal Cream

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Abstract: Nowadays fungal infection of skin is one of the most common dermatological problems Worldwide. It has been investigated that 40 billion people suffer from fungal disease. Superficial and subcutaneous fungal infection affect the skin keratinous tissues, and mucous membranes. The dermatophytosis infections, superficial candidiasis of the mouth, skin, or genital tract and infections due to Malassezia, such as pityriasis versicolor and Malassezia folliculitis are the main afflicting conditions. Systemic fungal infections may be caused by either an opportunistic organism that infects an at-risk host or may be associated with a more invasive organism or may be endemic to a specific geographical area. The most frequently encountered pathogens are Candida albicans and Aspergillus spp. but other fungi such as non-albicans Candida spp. are increasingly important in causing systemic fungal infections. There are numerous antifungal agents used clinically to treat fungal infections, i.e., azoles, allylamines, echinocandins, griseofulvin, and flucytosine. The course to modern treatment has not been without its problems and complications, particularly the drug resistances. Phytochemistry of various plant species has indicated that the phytochemicals could be a better source of medicine as compared to synthetically produced drugs. Natural medicines from a plant origin are still used as therapeutic agents, especially for treating bacterial, fungal, viral, protozoal, helminthic infections, etc. This review focuses on the use of plant constituents to prevent fungal infections caused by various pathogens. Hence, it will be proved beneficial for the drug industries.

Keywords: fungal infection

### I. INTRODUCTION

The humans live in peaceful coexistence with the surrounding microorganisms but an infection may emerge from the surrounding microorganisms when the defense system is damaged or the concentration of pathogens reach an exceptionally high density whereas infectious disease is a condition in which the infecting agents do elicit a response of the body, which leads to clinically manifest signs and symptoms. Bacteria, viruses, parasites, fungi, prions, worms, and helminths have all been involved in causing infectious diseases. A few decades ago, an infection caused by bacteria was the most feared and as the strategies to control bacterial infections in patients improved, but nowadays, fungi are the most hazardous pathogens.

Fungi exist in two basic forms: Yeasts and molds. Yeasts are typically single, small, and oval cells, whereas mold colonies consist of filamentous strands called hyphae. Some fungi are dimorphic, exists either as yeasts or molds depending on the external environment such as temperature Fungi are ubiquitous within the environment; however, only a few species are routinely found associated with humans who are capable of causing disease. A handful of fungi that is responsible for causing disease in healthy individuals are considered as true pathogens, (Histoplasma and Paracoccidioides), while the majority of fungi causing disease primarily in immuno-suppressed individuals are often classified as opportunistic pathogens (Candida and Cryptococcus) [4]. However, it is obvious that some opportunistic fungal pathogens also cause disease in otherwise healthy individuals (Candida vaginitis or Cryptococcus gattii outbreaks) Invasive fungal infections are characterized by high morbidity and mortality, although these infections are now more Frequent. they are still difficult to diagnose, prevent, and treat.

For a systemic effect, the intravenous or oral route is mainly used to treat topical fungal infection. However, it causes many side effects, including gastric irritation, diarrhea, nausea, vomiting and stomach pain, headache, fever, renal

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impairment, and anemia. Hence, the topical drug delivery is the most suitable routes for the administration of drugs that undergo first-pass metabolism. It is generally effective against fungal infections [8]. By spreading and rubbing ointments, creams, and gels applied directly to an external body surface for topical administration of drugs to the skin.

For the therapeutic effect, the drug must permeate and diffuse across the skin. The rate and extent of transport depend on the drug molecular properties and the characteristic of the biologic tissue. Advantages of the topical treatment of fungal infections include targeting the site of infection; increase the efficacy of treatment, reduction in the risk of systemic side effects, and to increase the patient Compliance.

There are numerous antifungal agents used clinically to treat fungal infections and can be broadly classified into five major classes, i.e., azoles, allylamines, echinocandins, griseofulvin, and flucytosine Although the course to modern treatment has not been without its problems and complications, particularly the drug resistances which have not had a major impact on the currently used antifungals with the exception of superficial Candidiasis infections; however, azole resistance is well recognized. The rise of Candida auris as a pathogen, which is resistant to multidrug is a further worry although it has not had a major impact on skin infection, superficial carriage is well documented Therefore, the discovery of novel antifungals is severely needed.

Phytochemistry of various plant species has indicated that the phytochemicals could be a better source of medicine as compared to synthetically produced drugs. The use of plants as medicine goes back to early man. These traditional medicines based on medicinal plants have been used for centuries. Therefore, one approach that has been used for the discovery of antimicrobial agents is the evaluation of plant extract.

Antifungal, also known as an antimycotic, is a medication that treats or prevents fungal infections. Antifungals work by killing or stopping the growth of fungi that cause infections. They can treat fungal infections in the skin, nails, respiratory system, and circulatory system.

Antifungal medications can be naturally occurring or synthetically produced. They work by:

- Inhibiting the synthesis of fungal cell walls and membranes
- Altering fungal membranes
- · Affecting microtubules
- Inhibiting nucleic acid synthesis
- Targeting the function of ergosterol, a key component in fungal cell membran

Here are some names of antifungal agents:

- Clotrimazole: A broad-spectrum topical antifungal used to treat candidiasis and dermatophyte infections
- Fluconazole: A triazole antifungal used to treat candidiasis and other fungal infections
- Miconazole: An original antifungal compound
- Oxiconazole: A topical antifungal used to treat dermatophyte infections
- Terconazole: An antifungal used to treat vulvovaginal candidiasis
- Nystatin: An organic polyene antifungal that can cause mouth soreness
- Griseofulvin: An antifungal antibiotic
- Caspofungin: An echinocandin antifungal
- Micafungin: An echinocandin antifungal

Antifungal drugs work by attacking the structure and function of fungal cells in a variety of ways, including:

Disrupting cell membranes

Many antifungal drugs work by disrupting the cell membrane of fungi. For example, polyenes bind to cell membranes, which alters their permeability and leads to cell death.

· Inhibiting ergosterol biosynthesis

Imidazole and triazole derivatives inhibit the biosynthesis of ergosterol, the main sterol in fungal membranes.

• Disrupting spindle and cytoplasmic microtubule function

Griseofulvin disrupts the function of spindle and cytoplasmic microtubules, which blocks fungal cell division.

• Accumulating squalene

Terbinafine inhibits the conversion of squalene to lanosterol, which leads to an accumulation of

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3. Histotical Background of Fungal

Until two to three decades ago only few drugs are available for treatment of fungal infection. the status of antifungal therapy changed dramatically in the late 1960s with the introduction of newer broader spectrum agents such as iodinated trichlorophenols and the imidazole, that acted by disruption of the fungal cell membrane some of the more recently developed broad spectrum antifungal drugs include the triazoles Terconazole itraconazole and fluconazole and Diphenylmorpholine amorolfine.

The allylamines represent one of the newest classes of compounds shown to be effective in the management of fungal disorder. The two members of the unique chemical classes that have been clinically naf-tifine and terbinafine are effective agents a wide spectrum of fungal organism.

Terbinafine has the added advantage of both topical and oral activity.

Here are some scientists and their contribution to the history of antifungal agents:

I. Rachel Fuller Brown: An American chemist who collaborated with microbiologist Elizabeth Lee Hazen to develop nystatin the first useful antifungal Antibiotic

II. Woolley: Reported the antifungal activity of benzimidazole in 1944

III. Richardson et al: Describe fluconazole a triazole antifungal drugs, in 1985

IV. Janssen Pharmaceutica: Describe miconazole and econazole in late 1960s, and Ketoconazole in 1981.

V. Bayer Ag: Develop clotrimazole in the late 1960s.

VI. Prof. Archana Chugh: Led of all women team of IIT Delhi researchers to develop a better Antifungal strategies for fungal keratitis.

4. Physiology of normal skin The skin is composed of three layers, Epidermis (50–100 μm) Dermis (1–2 mm) Hypodermis (1–2 mm)



Fig : The anatomical layers of the cutaneous tissue.

### 5. Types Of Fungal Infection

1. 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.

2. Deep infections: Affect internal organs as: lung, heart, brain leading to pneumonia, endocarditis, meningitis.[10] Overview of Fungal Skin Infections :

Fungi usually make their homes in moist areas of the body where skin surfaces meet: between the toes, in the genital area, and under the breasts. Common fungal skin infections are caused by yeasts (such as Candida or Malassezia furfur)

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or dermatophytes, such as Epidermophyton, Microsporum, and Trichophyton. Many such fungi live only in the topmost layer of the epidermis (stratum corneum) and do not penetrate deeper. Obese people are more likely to get these infections because they have excessive skinfolds, especially if the skin within a skinfold becomes irritated and broken down (intertrigo). People with diabetes tend to be more susceptible to fungal infections as well. Strangely, fungal infections on one part of the body can cause rashes on other parts of the body that are not infected. For example, a fungal infection on the foot may cause an itchy, bumpy rash on the fingers.[7]

These eruptions (dermatophytids, or identity or id reactions) are allergic reactions to the fungus. They do not result from touching the infected area.



Fig : Fungal skin infection.

#### 6.Cosmaceuticals

The word "cosmetics" is derived from Greek word "kosmtikos", which means "power, arrangement and ability in beautifying".

The word "Cosmaceuticals" made up of two word one is "cos metic" and another is "pharmaceutical". Cosmaceuticals are cosmetic products with bioactive ingredi ents purported to have medical benefits.

### Herbal cosmetics

Herbal cosmetics utilize natural ingredients derived from plants, herbs, and minerals to nourish and enhance the skin and hair. These products often exclude synthetic chemicals, making them popular for those seeking gentler alternatives. Ingredients like aloe vera, tea tree oil, lavender, and rosehip are common in herbal cosmetics for their soothing, moisturizing, and antioxidant properties. Many herbal cosmetics also incorporate traditional remedies from various cultures, such as Ayurveda and traditional Chinese medicine.

These products are believed to be safer and less likely to cause adverse reactions or skin irritations compared to their synthetic counterparts. Additionally, they're often environmentally friendly, as they're derived from renewable resources and may be biode gradable. However, it's essential to note that while herbal cosmet ics can offer benefits, individual reactions may vary, and it's crucial to choose products carefully and consult with a dermatologist if you have specific skin concerns

### Cream

Creams are semi-solid emulsions used to moisturize, protect, and nourish the skin. They consist of a combination of water, oil, and other ingredients like emulsifiers, thickeners, and preserva tives. Creams are versatile and come in various formulations to suit different skin types and needs, such as moisturizing creams, anti aging creams, and medicated creams for specific skin conditions.

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They provide hydration by preventing water loss from the skin and can also deliver active ingredients deep into the skin layers for targeted benefits. Creams are a popular choice for daily skincare routines due to their ease of application and effectiveness in im proving skin health [3]

### Antifungal Creams

Antifungal creams are topical medications used to treat fungal infections of the skin, such as athlete's foot, ringworm, and jock itch. These creams typically contain active ingredients like clotrim azole, miconazole, terbinafine, or ketoconazole, which work by in hibiting the growth of fungi and eliminating the infection. Antifun gal creams are applied directly to the affected area and are usually used for a specified duration as directed by a healthcare profes sional.

They provide relief from symptoms such as itching, redness, and irritation, and can effectively clear up fungal infections when used consistently and as prescribed. It's essential to follow the in structions on the packaging or provided by a healthcare provider for safe and effective use.



### 7. HERBAL ANTIFUNGAL AGENTS

Medicinal plants are of great importance to the health of individuals and communities, and their importance lies in the chemical substances that produce a definite physiological action on the human body. Many of the pharmaceuticals currently available have a long history of use as herbal remedies including opium, aspirin, digitalis, and quinine while their purification and quantification makes them more predictable and chemical processing can sometimes modify their effects in desirable ways. Herbal remedies tend to have a more complex and subtle mix of chemicals and can sometimes offer access to drugs or combinations of drugs that the pharmaceutical industry has not yet exploited. These natural compounds formed the basis of discovering modern drugs [74-76]. Some of the antifungal drugs most recently introduced in clinical practice are echinocandines and sordarines derived from natural products [77,78].

Therefore, there is a need to develop new antifungal agents providing new mechanisms of action, with a broad spectrum of antifungal activity, fewer dose-limiting side effects, and economic [79,80]. Some of the plants having wide fungal activity are listed in Table 1. Which will be proved beneficial for the pharmaceutical industry when formulated. Herbal formulations always have attracted considerable attention due to their good activity and comparatively lesser side effects when compared to synthetic drugs.

Here are some medicinal plants used in treatment of fungal infection:





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### I. Neem:

Neem, scientifically known as Azadirachta indica, is a versatile tree native to the Indian subcontinent. It holds significant cultural, medicinal, and agricultural importance. Neem has been used in traditional medicine for centuries. Its extracts contain compounds with antibacterial, antifungal, antiviral, and anti-inflammatory properties. Neem oil, derived from its seeds, is used topically to treat skin conditions like acne, eczema, and psoriasis. It's also used in oral care products for its ability to combat bacteria. Neem-based products are widely available in the market, including soaps, sham poos, lotions, toothpaste, and herbal supplements. These products capitalize on neem's antimicrobial and skin-nourishing properties.



### II. Turmeric:

Turmeric, scientifically known as Curcuma longa, is a flowering plant of the ginger family, native to the Indian subcontinent and Southeast Asia. It has been used for thousands of years in tradi tional medicine and cooking, particularly in India and other parts of Asia.

Curcumin and turmeric oil exert antifungal effect against two phytophagous fungi, namely, Fusarium solani and Helminthosporium oryzae. Turmeric oil exhibited the most effective antifungal activity against F. solani and H.



III. Aloe vera :

The Aloe vera gel is made up of water, amino acids, vitamins, lipids, sterols, tannins, and enzymes and also contains phenol, sa ponin, anthraquinones components, which have antiviral, antibac terial, and antifungal properties. Aloe vera is a plant species that has been used for centuries for its medicinal and healing proper ties. Aloe vera, a succulent plant species native to North Africa, is renowned for its multifaceted uses in traditional medicine and var ious industries. The plant's gel-like substance, found in its fleshy leaves, has been extensively studied for its potential health benefits and therapeutic properties.

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### 8. Mechanisms of Antifungal Action of Neem

Neem(Azadirachtaindica) exhibits potent antifungal effects attributed to its diverse array of bioactive compounds and their multifaceted mechanisms of action. These mechanisms include the disruption of fungal cell membranes, inhibition of fungal enzyme activity, interference with fungal cell wall synthesis, and modulation of fungal gene expression (Oliveira et al., 2018).

### • Disruption of fungal cell membranes

Azadirachtin, a prominent bioactive compound in neem, plays a crucial role in disrupting fungal cell membranes. Studies have revealed that azadirachtin alters membrane permeability and integrity, leading to destabilization and subsequent rupture of fungal cell membranes (Pavela, 2016). This disruption compromises the structural integrity of fungal cells, impairs their function, and ultimately leads to cell death.

### • Inhibition of fungal enzyme activity

Neem extracts have been shown to inhibit the activity of key fungal enzymes, further contributing to their antifungal effects. Notably, neem extracts have been found to inhibit enzymes such as chitin synthase and glucan synthase, which are essential for fungal cell wall synthesis (Sujatha et al., 2014). By interfering with these enzymatic processes, neem extracts impede the formation of fungal cell walls, thereby rendering the fungal cells vulnerable to environmental stressors and immune responses.

### · Interference with fungal cell wall synthesis

In addition to enzyme inhibition, neem compounds interfere with fungal cell wall synthesis through various mechanisms. These compounds disrupt the synthesis of fungal cell wall components, including chitin and glucans, crucial for maintaining fungal cell wall integrity and rigidity (Oliveira et al., 2018). This disruption compromises the structural integrity of fungal cells, impeding their growth and proliferation.

### • Modulation of fungal gene expression

Furthermore, neem components have been shown to modulate fungal gene expression, influencing various cellular processes essential for fungal survival andvirulence. By targeting specific genes involved in fungal metabolism, cell cycle regulation, and stress response pathways, neem compounds disrupt vital cellular functions, leading to growth inhibition and cell death (Oliveira et al., 2018).10–14 Neem's antifungal properties are mediated through a complex interplay of bioactive compounds and multiple mechanisms of action. By targeting key fungal cellular components and processes, neem exerts potent antifungal effects, making it a promising candidate for the development of novel antifungal therapies.

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### Efficacy

Efficacy against fungal pathogens

Neem (Azadirachta indica) exhibits broad-spectrum antifungal activity, demonstrating effectiveness against a diverse array of fungal pathogens, including Candida spp., Aspergillus spp., Cryptococcus neoformans, and dermatophytes (Bardají et al., 2015). This wide-ranging efficacy makes neem a promising candidate for the development of novel antifungal therapies.

### · Activity against planktonic and biofilm forms

Studies have elucidated the efficacy of neem extracts and neem-derived compounds against both planktonic and biofilm forms of fungal pathogens (Singh et al., 2017). Neem's ability to target fungal biofilms, which are notoriously resistant to conventional antifungal treatments, underscores its potential as a therapeutic agent against recalcitrant fungal infections. By disrupting biofilm formation and eradicating established biofilms, neem compounds offer a promising strategy for combating persistent fungal infections.

### • Inhibition of multidrug-resistant strains

Moreover, neem-based formulations have shown promising results in inhibiting the growth of multidrug-resistant fungal strains, further highlighting its potential as an alternative therapeutic option (Al-Marzoqi et al., 2020). In the face of rising antimicrobial resistance, the discovery of effective alternatives like neem is of paramount importance. Neem's ability to overcome resistance mechanisms exhibited by multidrug-resistant fungi underscores its value as a versatile and sustainable antifungal agent.

### • Clinical applications

Neem-based formulations, encompassing products such as neem oil, neem leaf extracts, and neem-based creams, have emerged as promising therapeutic options for the management of various fungal infections in clinical settings. Clinical studies have underscored the efficacy of these formulations in treating conditions such as candidiasis, dermatophytosis, and onychomycosis, among others (Siddiqui et al., 2017)

9. Formulation and Evaluation of Herbal Antifungal Cream

### · Herbal cosmetics

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### • Cream

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# Method and Methodology Ingredient

• Neem

Neem, scientifically known as Azadirachta indica, is a versatile tree native to the Indian subcontinent. It holds significant cultural, medicinal, and agricultural importance. Neem has been used in traditional medicine for centuries. Its extracts contain compounds with antibacterial, antifungal, antiviral, and anti-inflammatory properties. Neem oil, derived from its seeds, is used topically to treat skin conditions like acne, eczema, and psoriasis. It's also used in oral care products for its ability to combat bacteria. Neem-based products are widely available in the market, including soaps, sham poos, lotions, toothpaste, and herbal supplements. These products capitalize on neem's antimicrobial and skin-nourishing properties

### • Turmeric:

Turmeric, scientifically known as Curcuma longa, is a flowering plant of the ginger family, native to the Indian subcontinent and Southeast Asia. It has been used for thousands of years in tradi tional medicine and cooking, particularly in India and other parts of Asia [5]

### • Aloe vera

The Aloe vera gel is made up of water, amino acids, vitamins, lipids, sterols, tannins, and enzymes and also contains phenol, sa ponin, anthraquinones components, which have antiviral,

antibac terial, and antifungal properties. Aloe vera is a plant species that has been used for centuries for its medicinal and healing proper ties. Aloe vera, a succulent plant species native to North Africa, is renowned for its multifaceted uses in traditional medicine and var ious industries. The plant's gel-like substance, found in its fleshy leaves, has been extensively studied for its potential health benefits and therapeutic properties

 $\Box$  Other excipients

### • Glycerine

Glycerine, also known as glycerol, is a colorless, odorless, vis cous liquid that is sweet-tasting. It's commonly used in pharma ceuticals, cosmetics, food, and even explosives. Studies on glycerine cover its various applications, including its use as a moisturizer, its role in pharmaceutical formulations, and its potential health effects when ingested or applied topically. It is a trihydroxy sugar alcohol, meaning it contains three hydroxyl groups, which contrib ute to its solubility in both water and alcohol

### • Silica gel

Silica gel is a porous form of silica dioxide, synthetically man ufactured from sodium silicate. It appears as small, translucent beads or granules and is known for its high adsorption capacity.

Silica gel has a wide range of applications due to its ability to ab sorb and hold moisture, odor, and other substances without react ing chemically with them

### • Beeswax

Beeswax, a natural substance secreted by honeybees, plays a vi tal role in the hive's construction and maintenance. It is composed primarily of esters, fatty acids, and hydrocarbons, making it a complex mixture with various applications. Beeswax has a unique combination of properties that make it valuable in numerous in dustries. Its main components include palmitic, oleic, and linoleic acids, along with various alcohols like triacontanol and melissyl al cohol. These compounds give beeswax its characteristic odor and consistency [9]

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### • Methyl paraben

Methyl paraben is a commonly used preservative in cosmetics, pharmaceuticals, and food products due to its ability to inhibit mi crobial growth and extend product shelf life. Chemically, it belongs to the paraben family, which are esters of para-hydroxybenzoic acid. Methyl paraben is typically synthesized from para-hydroxy benzoic acid and methanol.

### • Rose Water

Rose oil, also known as rose otto or rose essential oil, is extract ed from the petals of various types of roses, primarily Rosa dama scena or Rosa centifolia. The extraction process typically involves steam distillation or solvent extraction, yielding a concentrated oil with a strong, floral scent. rose oil is often used in aromatherapy for its calming and mood-enhancing effects. Some studies suggest that inhaling the scent of rose oil may reduce anxiety and promote relaxation.

Sr.No	Ingreidient	Qunatity	Role
1.	Neem	20 ml	Antifungal agent
2.	Turmaric	10 ml	Antifungal agent
3.	Bentonite	4gm	Thickening Agent
4.	Aloe Vera Gel	20ml	Soothing Agent
5.	Glycerine	10 ml	Lubricant
6.	Tragacnath	10 ml	Emulsifier
7.	Beeswax	1.5 gm	Emollient
8.	Borax	0.2gm	Buffer
9.	Silica gel	0.1 gm	Adsorbant
10.	Methylparaben	0.2gm	Preservative
11.	Rose water	q.s	Fregrance

10 .Methodology for antifungal cream : NEEM EXTRACT



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#### Method of preparation Take two beaker A & B, wash and clean properly.

In Beaker A

- Take aloe vera gel & boil on water bath.
- Add neem extract and turmeric extract with continuous stirring.



Figure 3: Water Phase.



Figure 4: Aloe vera.

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### In Beaker B



Result : Herbal Antifungal Cream was Prepared and stored in airtight Container.



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11 .Evaluation parameter :

1. Physical properties:

The physical properties of antifungal cream play a significant role in its usability, efficacy, and overall user experience. The cream was observed for colour, odour, appearance and texture.

Sr.No	Properties	Observation
1	Colour	Yellow
2	Odour	Characteristics
3	Apperance	Semi -solid
4	Texture	Smooth

### 2. Patch test

A patch test for a herbal antifungal cream involves applying a small amount of the product onto a small area of the skin, typi cally on the forearm or behind the ear.

The purpose of this test is to evaluate the cream's potential for causing irritation or allergic reactions in sensitive individuals. After application, the area is ob served for any signs of redness, swelling, itching, or other adverse reactions over a period of 24 to 48 hours. This test helps to assess the cream's safety profile and determine if it is suitable for use on larger areas of the skin without causing harm or discomfort

### Result

No any inflammation or irritation to the skin

Spreadability test

The spreadability test for a herbal antifungal cream assesses its ability to evenly distribute and cover a given surface area upon application. This test typically involves placing a fixed quantity of the cream onto a standardized surface, such as glass or a skin mimic substrate, and measuring the diameter of the spread after a specified time period. Factors like viscosity, texture, and formula tion components influence the cream's spreadability. A cream with good spreadability ensures uniform coverage, easy application, and enhanced efficacy. This test helps in optimizing formulation param eters to achieve desired spreading characteristics for better con sumer experience and therapeutic outcomes .

### Result

Good spreadability ensures uniform coverage, easy application, and enhanced efficacy

Viscosity :

The viscosity of formulated antifungal creams was measured by Brook field Viscometer using 4 spindle at varying speed and shear rates. This viscosity ensures uniform coverage, facilitating the ab sorption of active ingredients into the skin for maximum efficacy against fungal infections. Additionally, the cream's viscosity con tributes to its stability, preventing separation of ingredients and ensuring a consistent texture throughout its shelf life.

Homogeneity :

The homogeneity of herbal antifungal cream is crucial for con sistent effectiveness and application. Ensuring uniform distribution of active ingredients throughout the product is essential to guarantee each application delivers the intended benefits.

Achiev ing homogeneity involves meticulous formulation and manufac turing processes, including thorough mixing of ingredients and quality control measures. Manufacturers utilize techniques like blending, emulsification, and particle size reduction to achieve de sired consistency. Additionally, analytical methods such as visual inspection, microscopy, and spectroscopy are employed to assess homogeneity. By maintaining homogeneity.

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Screening of Neem, Turmaric and aloe vera extract for antifungal activity:

- Take a slice of bread. Sprinkle some water on both sides of bread slice.
- Place a bread slice in a container closed it and wait for 3 to 5 days.
- After 5 days we can observe cluster of tiny plants on bread slice, mould (Aspargillus) is a type of the fungi that grow on bread.
- After growing the fungus on bread add extract on the bread.
- After adding our extract and wait for a 2 days.
- The results comes after 2 days shows our extract is able to kill the fungus and having antifungal activity.





Antifungal activity on bread

12 .Review of literature :

□ Premkumar, T. Muthukumaran, V. Ganesan, Shanmugam R., Priyanka D. L-(oct 2014- march 2015). This research paper consist of: A novel cream formulation consisting of combination of miconazole nitrate, mupirocil and hydrocortisone was prepared. The formulation was subjected to in- vitro diffusion studies. Microbiological studies and in- vivo skin irritation studies were performed to find out the safety of material used in the formulation. The developed cream consisting of combination of miconazole nitrate, mupirocil, and hydrocortisone was found to be safe and effective for the treatement of skin infection.

 $\Box$  Amulyaratna behera & Sumit kumar sahoo-(Jun 2012). This research paper consist of: GB-loded PLGA NPs were prepared by solvent evaporation technique using methanol/dichloromethane(2:1) & characterize by transmission

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electron microscopy(TEM), and differential scanning calorimetry(DSC). effect of strring speed(250,1000,1500,2500 rpm) and drug : polymer (1:1,1:2,1:3 and 2:1) on particle size, size distribution, zeta potential, drug loading, encapsulation efficiency and drug release was also studied. Stable NPS were successfully prepared without any incompatibility, as indicated by TEM and DSC studies, respectively. As polymer and drug concentrations and stirring speed increased, particle size, drug loading and encapsulation efficiency also increased. Increase in polymer concentration sustained drug release but reverse was obtained as drug concentration increased.

 $\Box$  Ashwini. S.Dhase, Somishwar.S. Khadbadi and Shweta.S. Sahoo-(2014). This research paper consist of: The purpose of the present research work was to formulate and evaluate vanishing herbal cream. Herbal creams offer several advantages over the other creams.

 $\Box$  The majority of existing creams which has prepared from drug of synthetic origin, such as acyclovir, triamcinolone, calcipotriene, mometasone, extracts gives fairness to face, but it has several side effects such as itching or several allergic reactions. Herbal cream do not have any of these side effects, without side effects it gives the fairness look to skin.

# **II. CONCLUSION**

Although wide progress has been made in recent decades in medicine, fungal infections are still an unsolved health problem. It is mainly due to the fact that some of the available antifungal drugs cause resistance. The plant kingdom is a rich source of medicinal preparations that offer a wide chemical diversity, making it of huge potential for new drug development. Phytochemistry of various plant species has indicated that the phytochemicals could be a better source of medicine as compared to synthetically produced drugs. Researchers over the last years have developed a variety of chemical structures with antifungal activity based on natural compounds which are in the process of design and development. Thus, the plant kingdom holds a lot of potential which further needs to be explored in depth.

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