A Review on Herbal Antifungal Cream

Saurabh.J.Makhare[1], Kajol.B.Sonawane[2], Aditya.D.Sathe[3]
[1,3]*Student, Bachelor of Pharmacy, Sahakar Maharshi Kisanrao Varal Patil College of Pharmacy, Nighoj, Maharashtra, India*
[2]*Assistant Professor, Bachelor of Pharmacy, Sahakar Maharshi Kisanrao Varal Patil College of Pharmacy, Nighoj, Maharashtra. India*

Abstract: Herbal antifungal creams are emerging as effective and safer alternatives to synthetic topical agents. This review highlights the therapeutic potential of Indian herbs—*Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem), and *Curcuma longa* (Turmeric)—which are widely recognized for their antifungal, anti-inflammatory, and antioxidant properties. These botanicals are incorporated into creams aimed at treating superficial fungal infections such as athlete's foot, ringworm, and candidiasis. Alongside these active ingredients, formulation components like beeswax, borax, and liquid paraffin enhance the cream's stability, texture, and application. Evaluation methods, including pH analysis, spreadability, washability, and skin irritancy tests, further support the safety and effectiveness of these herbal formulations. While herbal medicine offers key advantages such as lower side effects, environmental sustainability, and affordability, challenges like standardization and slower onset of action remain. As global demand for natural and eco-friendly products continues to grow, herbal antifungal creams provide a promising blend of traditional wisdom and modern therapeutic innovation.

Keywords – Herbal Antifungal Cream, Plant-Based Antifungals, Indian Medicinal Herbs, Ocimum sanctum, Azadirachta indica, Curcuma longa, Skin Fungal Infections, Natural Topical Formulations.

INTRODUCTION

Indian herbs are well-known around the world for their many uses. Natural cosmetics made from herbs are a valuable gift from nature and are in high demand globally. Herbal products are popular because they work well and usually don't have side effects like chemical-based products. Cosmetics made with herbs can help heal the skin, improve appearance, and make the skin feel better and healthier. As more herbs are being used in beauty and personal care products, the demand for herbal cosmetics is growing. Using synthetic (chemical) products for a long time can harm both our skin and the environment. Chemicals and artificial dyes can cause many skin problems and other harmful effects. That's why it's better to use herbal products whenever possible. Traditional medical systems like Ayurveda, Unani, and Homeopathy also include information about herbal skin care products. These products are made from raw herbs or herbal extracts. Herbal medicine is one of the oldest and most widely used types of healthcare. It has developed a lot in recent times to better treat health problems. According to the World Health Organization (WHO), about 80% of people worldwide use herbal medicine as their main form of healthcare. Herbal remedies are commonly used for self-treatment in many countries. Modern herbal medicine is based on clinical experience, traditional knowledge, medical science, and scientific research. More and more people are now turning to alternative and natural treatments.

Advantages of herbal system of medicines:

- Lower risk of side effect.
- Natural Origin and biocompatibility.
- Cost effective.
- Sustainability and environmental benefits.
- Support for preventive healthcare.
- Potential for drug discovery.

Disadvantages of herbal system of medicines:

- High amount of raw material is required for processing the medicine.
- Lack of standardization and Quality Control.
- Drug Herb interactions.
- Slow Onset of action.
- Bulk dosing.
- Contamination and Adulteration.

Physiology of normal skin:
Skin is composed of three layers

- Epidermis (50-100 μm)
- Dermis (1-2 mm)
- Hypodermis (1-2mm)

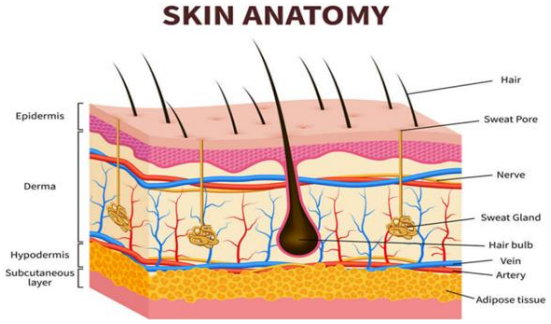


Fig: The anatomical Layers of cutaneous tissue.

Objective

The Antifungal Cream are designed to treat fungal infection like ringworm and yeast infection, athlete's foot. They includes some common active ingredient in these cream.

1. Ketoconazole – Commonly use for skin and yeast infections.
2. Clotrimazole – Effective against a range of fungi including those that cause skin infections.
3. Terbinafine – Particularly effective for dermatophyte infections.
4. Meconazole – Often used for athlete's foot and other fungal skin conditions.

When using antifungal cream, apply it to the affected area as directed on the label. If the problem doesn't get better or gets worse, talk to a doctor.

Fungi:

Fungi represent a distinct kingdom of primarily multicellular eukaryotic life forms that obtain nutrients heterotrophically and contribute significantly to nutrient recycling in ecosystems.

Types of fungal infection

1. Athlete's foot
2. Ringworm
3. Yeast infections
4. Nail fungus
5. Scalp ringworm

Fungal treatment

The Antifungal creams are topical medications used to treat fungal infections of the skin, like athlete's foot, ringworm, and jock itch. These creams contain active ingredients like Clotrimazole, Miconazole, Terbinafine, and Ketoconazole, which inhibiting the growth of fungi and eliminating the infection. Antifungal creams are applied directly to the affected area and are usually used for a specified duration as directed by a healthcare professional. 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 instructions on the packaging or provided by a healthcare provider for safe and effective uses.

INGREDIENTS

Sr No	Ingredients	Role
1	Tulsi Extracts	Antifungal(API)
2	Neem	Antifungal
3	Turmaric	Antifungal
4	Beeswax	Emulsifying agent
5	Borax	Buffering agent
6	Liquid paraffin	Emollient
7	Methyl paraben	Preservative
8	Distilled water	Solvent
9	Rose oil	Perfume

Tulsi:

Kingdom: Plantae
Family: Mints
Synonyms: Gauri, Bahumanjari, Pavani, Gramya, Surasa.
Botanical name: ocimum tenuiflorum
Common name: holy basil Part of typical used: leaves
Colour: Green
Chemical constituents: eugenol, terpens, germacrene.

Description: Holy basil is an erect, many branched subshrub, 30–60 cm (12–24 in) tall with hairy stems. Leaves are green or purple; they are simple, petioles with an ovate blade up to 5 cm (2 in) long, which usually has a slightly toothed margin.

Uses :

- Reduces Fever (Antipyretic)&(Analgesic)
- Reduces strain & Blood stress
- Anti-most cancers residences.

Neem:

Botanical name- Azadiracta indica.
Family: Meliaceae typically used- Leave.
Colour- Green.
Description: Compound alternate, rachis 15-25cm long, 0.1cm thick, leaflet with oblique, serrate, 7-8.5 cm long and 1-1.7 cm wide slightly yellowish green in colour. Constituents- flavonoids, Alkaloids, Azadirone, nimbin, nimbidin, terpenoid, steroids,tannic acid and Saponin sursertin are present in Neem Leaf.

Uses:

- Treats Fungal infection
- It increases Immunity
- Treats wounds
- It used to Detoxification
- It has anti allergic properties

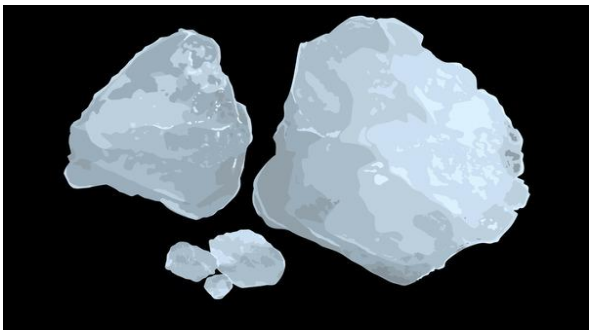
TERMARIC:

Biological name: Curcuma longa
Common name: Haldi
Chemical constituents: protein, fat, Mineral and Carbohydrates.
Part typically used: root

Beeswax:

Beeswax is a natural waxy substance secreted by the wax glands of worker honeybees (Apis mellifera). It plays an indispensable role in the hive, where it is used for the construction of honeycombs that serve as storage for honey and pollen, as well as a nursery for developing brood. The secretion process begins when bees consume honey and convert sugars into wax scales, which are then molded into hexagonal cells. From a chemical perspective, beeswax is a complex mixture of organic compounds, predominantly composed of esters (70–72%), hydrocarbons (12–15%), and free fatty acids (12–14%). The major fatty acids present include palmitic acid, oleic acid, and linoleic acid, while the alcohol fraction consists of long-chain alcohols such as triacontanol and melissyl alcohol. These components contribute to the unique aroma, plasticity, melting behavior, and hydrophobic nature of beeswax. The physical properties of beeswax, such as its melting point (62–65 °C), pliability, and resistance to rancidity, are largely attributed to this complex chemical composition. Its characteristic yellowish colour and honey-like odour arise from minor constituents such as carotenoids and aromatic compounds

Borax:

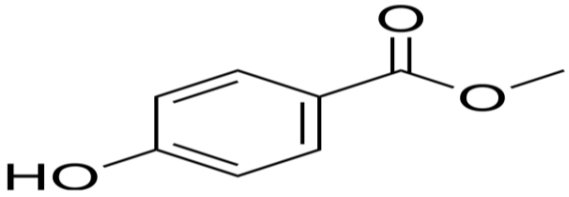


Borax, or sodium borate ($Na_2B_4O_7 \cdot 10H_2O$), is a widely utilized inorganic compound with diverse applications across industrial and household sectors. Major natural deposits are found in Turkey, the United States, and Chile. It occurs as a white, odourless crystalline powder that exhibits high solubility in water. A prominent characteristic of borax is its buffering capacity, enabling stabilization of pH in aqueous systems. This property underpins its incorporation into detergents, cosmetic formulations, and, in certain cases, as a food additive.In pest management, borax is employed due to its toxicity toward ants and rodents. Owing to its delayed action, worker ants transport the compound back to the colony, thereby disseminating the toxic effect. Chemically, borax functions as a source of borate, which demonstrates strong complexation abilities with various agents in aqueous media, forming stable complex ions. This feature is exploited in borate-affinity chromatography, where borate in combination with a polymer matrix allows selective separation of non-glycated hemoglobin from glycated hemoglobin (primarily HbA1c). HbA1c measurement is a key diagnostic tool for evaluating long-term hyperglycemia in diabetes mellitus.

Liquid Paraffin:

Liquid paraffin, also known as paraffinum liquidum, paraffin oil, mineral oil, or Russian mineral oil, is a highly purified fraction of petroleum obtained through extensive refining processes. Unlike the common usage of the term “paraffin” to describe kerosene or other hydrocarbon fuels, liquid paraffin specifically refers to a clear, odourless, tasteless, and chemically stable oil suitable for cosmetic and pharmaceutical applications. The generic application of the word “paraffin” is rooted in its association with alkanes, the saturated hydrocarbons that constitute its primary chemical composition. From a physicochemical standpoint, liquid paraffin is characterized by high viscosity, hydrophobicity, chemical inertness, and resistance to oxidation. These properties make it an ideal excipient and protective agent in formulations where stability and safety are essential. In cosmetics, liquid paraffin functions primarily as an emollient, moisturizer, and skin-conditioning agent, forming an occlusive layer on the skin that prevents trans epidermal water loss. It is widely incorporated into lotions, creams, ointments, and hair care products. In medicine, liquid paraffin is employed both topically and internally. Topically, it is used in dermatological preparations for the management of dry skin conditions, eczema, and psoriasis. Orally, it acts as a mild laxative, providing relief in cases of constipation by softening stool and lubricating the intestinal tract. Due to its non-digestible nature, it passes through the gastrointestinal system largely unchanged. Pharmaceutical-grade liquid paraffin is subject to rigorous purification to eliminate toxic aromatic hydrocarbons, ensuring biocompatibility and patient safety. However, excessive or prolonged ingestion may lead to side effects such as lipid pneumonia if aspirated. Beyond healthcare, liquid paraffin also finds use in laboratory, industrial, and histological practices. It is employed as a lubricating agent, a non-conductive fluid in electrical systems, and as a medium for embedding tissue samples in microscopy.

Methyl Paraben:



Methyl Paraben is one of the most widely utilized preservatives in cosmetics, pharmaceuticals, and food formulations owing to its antimicrobial activity and its effectiveness in prolonging product shelf life. Chemically, it is a member of the paraben class, which comprises esters of p-hydroxybenzoic acid. Industrially, methyl paraben is commonly synthesized through the esterification of p-hydroxybenzoic acid with methanol.

Distilled Water: Distilled water is water that has undergone a purification process involving boiling to produce vapour, followed by condensation back into liquid form in a separate container. During distillation, dissolved salts, minerals, and other non-volatile impurities that have higher boiling points than water remain in the original vessel, resulting in a product with significantly reduced levels of contaminants.

As such, distilled water is considered a highly purified form of water, commonly used in scientific, medical, and industrial applications. In chemical and biological laboratories, distilled water is essential for preparing reagents, buffers, and solutions where the presence of ions or other impurities could interfere with chemical reactions, enzymatic activities, or analytical measurements. In industrial and domestic contexts, it is used in appliances such as steam irons, humidifiers, and autoclaves to prevent mineral deposits, scaling, or corrosion. In situations where cost is a concern, alternative purified waters, including deionized water or reverse osmosis water, are often employed. For applications that demand exceptionally high purity, double-distilled water is preferred. The importance of using purified water extends beyond laboratory settings. For example, ions commonly found in tap water, such as calcium, magnesium, and chloride, can drastically reduce the operational lifespan of lead–acid batteries and are unsuitable for automotive cooling systems, as they accelerate corrosion of engine components and diminish the efficacy of antifreeze additives. Distillation remains a reliable method for producing water that minimizes these risks, ensuring both chemical integrity and the longevity of sensitive equipment.

Rose Oil:

Rose oil, also referred to as rose Otto or rose essential oil, is a highly valued essential oil obtained from the petals of various rose species, primarily Rosa damascena and Rosa centifolia. The oil is commonly extracted through steam distillation, although solvent extraction or enfleurage may also be employed to obtain higher yields of aromatic compounds. The resulting product is a concentrated oil with a characteristic rich floral scent, highly prized in perfumery, aromatherapy, and cosmetic formulations. Chemically, rose oil is composed of a complex mixture of volatile constituents, including monoterpenes (e.g., citronellol, geraniol, nerol), phenylpropanoids (e.g., phenylethyl alcohol), and trace amounts of sesquiterpenes. The composition varies depending on species, geographical origin, climatic conditions, and extraction method. These constituents contribute not only to the oil's aroma but also to its therapeutic properties. In aromatherapy, rose oil is extensively used for its anxiolytic, mood-enhancing, and relaxation-promoting effects. Experimental studies suggest that inhalation of rose oil may reduce stress, decrease cortisol levels, and alleviate symptoms of anxiety and depression. In addition, rose oil exhibits antimicrobial, anti-inflammatory, and antioxidant activities, making it valuable in skincare products, soaps, and cosmetic formulations aimed at soothing, moisturizing, and protecting the skin. Due to its potent aroma and biological activity, rose oil is also incorporated in perfumery and high-end fragrance products, often as a

base note to impart depth and longevity to scents. The high demand and labour-intensive extraction process make it one of the most expensive essential oils in the market.

Benefits of Antifungal Cream:

- Targeted Action.
- Rapid Symptom Relief.
- Prevention of inspection spread.
- Ease of use and Accessibility.
- Reduce Risk of Resistance.

Evaluation of anti fungl cream:

The pH of each formulation was evaluated using a digital pH meter. To prepare the sample, 0.5 g of the formulation was uniformly dispersed in 50 mL of distilled water prior to measurement.

Spreadability test:

The spreadability of the ointment was assessed by examining its sliding and drag characteristics. About 2 g of the ointment was placed on a ground glass slide, and a second slide of identical dimensions was positioned on top. A hook was placed between the slides, and a weight of 1 kg was applied for five minutes to remove trapped air and ensure a uniform layer of ointment. Excess material around the edges was carefully scraped off. The top slide was then pulled using an 80 g weight attached to a string connected to the hook, and the time taken for the slide to move a predetermined distance was recorded. This procedure provides a quantitative measure of the ointment's spreadability, indicating its ease of application and consistency.

Washability Test

To assess washability, 0.5 g of the formulated cream was applied to the skin and rinsed with lukewarm water. The duration required for complete removal of the formulation was recorded.

Irritancy Test

For the evaluation of skin irritancy, a 1 cm^2 area on the dorsal surface of the left hand was marked. The cream was applied to this region, and observations were conducted at regular intervals over a 24-hour period. Any signs of erythema or edema were noted and documented.

APPLICATION

- Apply a thin layer: Apply a thin layer of cream to the affected area, and a small amount to the surrounding
- Clean and dry: Before applying the cream, clean and dry the affected area.
- Wash hands: Wash your hands before and after use, unless you're treating a hand or nail infection, in which case you should only wash your hands before use.

CONCLUSION

Herbal antifungal creams are topical formulations prepared using plant-derived bioactive compounds with proven antifungal properties. Common herbal ingredients include Azadirachta indica (neem), Curcuma longa (turmeric), Ocimum sanctum (tulsi), which exhibit antifungal, anti-inflammatory, and antioxidant activities. These creams are often used to treat superficial fungal infections such as tinea, candidiasis, and other dermatophytic infections.

REFERENCE

[1] Kusum Kaushik and Shweta Agarwal. "Role of herbal antifungal agents for the management of fungal diseases". Asian Journal of Pharmaceutical and Clinical Research 12.7 (2019).

[2] Cristian J Zambrano., et al. "Diversity and distribution of macro fungi (Ascomycota)". Biodiversity Data Journal 11 (2023): e 104307.

[3] Peter C Lwel and Ishwor Thapa. "Review of methods for identification of Zygomycota". Labmedicine 42.5 (2011).

[4] Jason E Stajich and Mary L Berbee. "The fungi". Current Biology 19.18 (2018): R840.

[5] Maha HL, Sinaga KR, Sinaga KR, Masfria M, Masfria M. Formulation AND evaluation of miconazole nitrate nanoemulsion AND cream. Asian J Pharm Clin Res. 2018;11(3):319-21. Doi: 10.22159/ajpcr.2018.v11i3.22056.

[6] Powar, A. D., & Nitave, S. A. (2022). A Review–Polyherbal Antifungal Cream. World Journal of Pharmaceutical Research, 906-911.

[7] C.k. Kokate; A.P Purohit; S.B. Gokhale; Textbook Of Pharmacognocy; Nirali Prakashan; 15th Edition; Sept., 2014; 16.67-16.68.

[8] Deosarkar S.S; Khedkar C.D; Kalyankar S.D; Sarode A.R; The Encyclopedia Of food And

Health, Volume-2, Oxford Academic Press, 2016; 331-332.

[9] Gupta, S.K, Prakash J and Srivastava S. Validation of traditional claim of Tulsi, Ocimum sanctum Linn. As a medicinal plant. Indian J Exp Biol. 2002:5:765-773.

[10] Deosarkar S.S; Khedkar C.D: Kalyankar S.D: Sarode A.R: The Encyclopedia Of food And Health. Volume2.Oxford Academic Press, 2016; 331-332

[11] Https://www.slideshare.net/slideshow/physica l-factors-affecting-the-growth of fungipptx/ 25185 9735.

[12] Purushotham Rao K, Khaliq K, Kharat SS, Sagare P, Patil SK. Preparation and evaluation of o/w cream for skin psoriasis. Int J Pharm Biol Sci. 2010; 1:3

[13] Premkumar A, Muthukumaran T, Ganesan V, Shanmugam R, Priyanka D. Formulation and evaluation of cream containing antifungal agents, antibacterial agents and corticosteroids, Hygeia. JD Med 2014;6(2):5-16

[14] Campuzano A., Wormley F.L. Innate immunity against Cryptococcus, from recognition to elimination. J. Fungi (Basel). 2018; 4:33. - PMC - pubmed

[15] Nakamwi Akombaetwa, Lungwani Tyson Muunga, James Nyirenda, Sergio Muwowo. Formulation And Assesment of the Efficacy And Stability of an Ointment containing O. Americanum l. Extract. Clinical Complementary Medicine and Pharmacology 3 (2023)

[16] Arati D Powar and Dr. Sachin A. "Nitave Polyherbal Antifungal Cream". World Journal of Pharmaceutical Research 11.5 (2022): 904-920.

[17] C.k. Kokate: A.P Purohit: S.B. Gokhale; Textbook of Pharmacognocy; Nirali Prakashan; 15th Edition; Sept., 2014; 16.67- 16.68. 20. Prashant Chavan, Mallinath Kalshetti, Nikhil Navindgikar et al., Formulation and Evaluation of Polyherbal Cream, International Journal of Current Pharmaceutical Research ISSN- 0975-7066; Vol 12, Issue 4, 2020

[18] Sumathi A: Senthamari R.: A Review on Harbal Medicines and Drug Technology Asia. J.Pharm. Health Science, 2015; 1172-1173.

[19] Review on Herbal Antifungal Cream" by Krishna Bhendarkar, Rohit Dongre, Himanshu Dhameja, Prashant Bawankar (Int. J. of Pharm. Sci., 2025)

[20] A REVIEW ON ANTIFUNGAL HERBAL CREAM" by Saberi Bilal Ahmed et al. (2023)