

Formulation and Evaluation of Anti- Fungal Herbal Cream

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Abstract: *Herbal cosmetics are the preparations used to enhance the human appearance. The aim of the present research was to formulate the herbal Cream for the purpose of Moistening, Nourishing, lightening & Treatment of various diseases of the skin. Different crude drugs; Aloe barbadensis (Aloe Vera leaves), Ocimum Sanctum (Tulsi-leaves), Azadirachta Indica (Neem- leaves), Curcuma longa (Turmeric rhizomes), Cedro Oil (Lemon Peel), Myristica fragrans (Nutmeg seeds), Olium rosae (Rose Oil), Orange Oil, Prunus dulcis (Almond oil) were taken. Accelerated stability testing of two final sample has been conducted in the environmental chamber with temperature $25 \pm 10C$ and humidity $60 \pm 10\% RH$. All the products were found to be stable with no sign of phase separation and no change in the color. The patch test for sensitivity testing has also been done and no evidence of skin irritation and allergic signs. This work mainly focuses on the assessment of the microbial quality of Formulated cosmetic preparations. . To the surprise, both formulations was found to comply with the microbial limit tests as per the international specifications. Thus herbal cosmetics formulation is safe to use was proved and it can be used as the provision of a barrier to protect skin.*

Keywords: Herbal cosmetics.

I. INTRODUCTION

The concept of beauty and cosmetics is as ancient as mankind and civilization. Indian herbs and its significance are popular worldwide. An herbal cosmetic have growing demand in the world market and is an invaluable gift of nature. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. Herbal cosmetics are defined as the beauty products which possess desirable physiological activity such as healing, smoothing appearance, enhancing and conditioning properties because of herbal ingredient. Now days the usefulness of herbs in the cosmeceutical production has been extensively increased in personal care system and there is a great demand for the herbal cosmetics. Cosmetics are the substances intended to be applied to the human body for cleansing, beautifying, promoting attractiveness, and altering the appearance without affecting the body's structure or functions. But the usage of synthetic products becomes very harmful from long time for the youth as well as our environment. Various synthetic compounds, chemicals, dye and their derivative proved to cause various skin diseases having numerous side effects. Thus we are using herbal cosmetics as much as possible. The basic idea of skin care cosmetic lies deep in the Rig-Veda, Yajurveda, Ayurveda, Unani and Homeopathic system of medicine. These are the products in which herbs are used in crude or extract form. These herbs should have varieties of properties like antioxidant, anti-inflammatory, antiseptic, emollient, anti – seborrhatic , antikerolytic activity and antibacterial etc.

Cosmetics are developed to reduce wrinkles, fight acne and to control oil secretion. For various types of skin ailments formulations like skin protective, sunscreen, antiacne, antiwrinkle and antiaging are designed using varieties of materials, either natural or synthetic. Cream is a polyherbal formulation that consists of Tulsi oil. That herbs have been selected on the basis of a traditional system and scientific justification with modern uses. A herbal cream that can give effective protection to skin and free from any toxicity or toxic residue or any irritation when regularly used and should also be cosmetically acceptable.

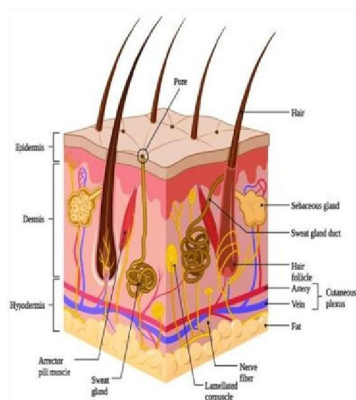
Herbal medicine is one of the oldest and most universal system of health care system .The Advancement in the field of herbal drug delivery started recently with the aim to manage human diseases efficiently. World Health Organization

(WHO) estimates that 80% of the world populations presently use herbal medicine for primary health care. Every nation is seeking healthcare beyond the traditional boundaries of modern medicine; turning to self medication in the form of herbal remedies. Modern herbal medicine is based upon the combination of traditional knowledge, clinical experience, understanding of medicinal science and scientific evidence of herbal medicine. People are slowly and gradually switching to alternative forms of medicine.

Advantages of herbal system of medicines

- Lower risk of side effects
- Widespread availability
- Effectives with chronic medicine
- Low cost effectiveness make them all the more alluring
- Natural detoxification process of the body is effectively enhanced by herbalmedicine .
- Disadvantages of herbal system of medicines
- Bulk dosing.
- Poor stability in higher acidic pH, liver metabolism etc.
- Large molecular size limiting the absorption via passive diffusion.
- High amount of raw material is required for processing the medicine. Isolation and purification of individual components from whole herbal extract lead to partial or total loss of therapeutic activity.

Normal physiology of skin



The skin is composed of three layers,

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

The barrier to percutaneous absorption lies within the stratum corneum, the most superficial layer of the epidermis. The function of the stratum corneum is to reduce water loss, provide protection against abrasive action and microorganisms, and generally act as a permeability barrier to the environment. The stratum corneum is a 10–20 μm thick, multilayer stratum of flat, polyhedral-shaped, 2 to 3 μm thick, non-nucleated cells named corneocytes. Corneocytes are composed primarily of insoluble bundled keratins surrounded by a cell envelope stabilized by cross-linked proteins and covalently bound lipids. Corneodesmosomes are membrane junctions interconnecting corneocytes and contributing to stratum corneum cohesion. The intercellular space between corneocytes is composed of lipids primarily generated from the exocytosis of lamellar bodies during the terminal differentiation of the keratinocytes. These lipids are required for a competent skin barrier function.

The epidermis is composed of 10–20 layers of cells. This pluristratified epithelium also contains melanocytes involved in skin pigmentation, and Langerhans' cells, involved in antigen presentation and immune responses. The epidermis, as

for any epithelium, obtains its nutrients from the dermal vascular network The epidermis is a dynamic structure and the renewal of the stratum corneum is controlled by complex regulatory systems of cellular differentiation. Current knowledge of the function of the stratum corneum has come from studies of the epidermal responses to perturbation of the skin barrier such as:

Extraction of skin lipids with apolar solvents

Physical stripping of the stratum corneum using adhesive tape(iii)Chemically-induced irritation
fungi

Fungi are a kingdom of usually multicellular eukaryotic organism that are heterotrops and have important role in nutrient cycling in an ecosystem”.

Characteristics of fungi:

Some fungi are single-celled, while others are multicellular. single-celled fungi are called yeast. some fungi alternate between single celled yeast and multicellular forms depending on what stage of the life cycle they are in. Fungi cells have a nucleus and organelles, like plant and animal cells do. The cell walls of fungi contain chitin, which is hard substance also found in the exoskeletons of insects and arthropods such as crustaceans. They do not contain cellulose, which commonly makes up plant cell walls. Multicellular fungi have many hyphae, which are braching filaments. Hyphae have tubular shape and are split into cell-like compartments by walls that are known as septa. These cells can have more than one nucleus ,and nuclei and other organelles can move in between them. A fungus network of hyphae is calles a mycelium.

Types of Fungi:

Chytridiomycota

Zygomycota

Glomeromycota

Ascomycota

Chytridiomycota: Chytrids, the organisms found in Chytridiomycota, are usually asexual, and produce spores that no around using flagella, small tail like appendages. It can cause fungal infection in frogs by burrowing under their skin.

Zygomycota: These are mainly terrestrial. They cause problem by growing on human few soures.

Ex :Rhizopus stolonifer a bread mold

Glomeromycota: They are found in soil. The fungi obtain sugar from plant and in return,dissolves, minerals in the soil to provide the plant with nutrients. This fungi also reproduce asexually.

Ascomycota: These are the pathogens of plant and animals,including humans in whichthey are responsible for infection like Athlete’s Foot, Ringworm, and ergotism, whichcauses vomiting, convulsions, hallucination.and sometimes even death.

Fungal Infection :

Definition: - an inflammatory condition caused by a fungus. mycosis. zymosis - (medicine) the development and spread of an infectious disease (especially one caused by a fungus) blastomycosis - any of several infections of the skin or mucous membrane caused by Blastomycosis.

Fungal infections are common throught much of natural world. In humans, fungal infectionoccur when an invading fungus takes over an area of the body and is too much for the immune system to handle. Fungi can live in the air, soil, water and plants. There are also some fungi that live naturally in the human body.

Type of fungal infection:

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

Deep infections: Affect internal organs as: lung, heart, brain leading to pneumonia, endocarditis, meningitis.



Overview of Fungal Skin Infections:

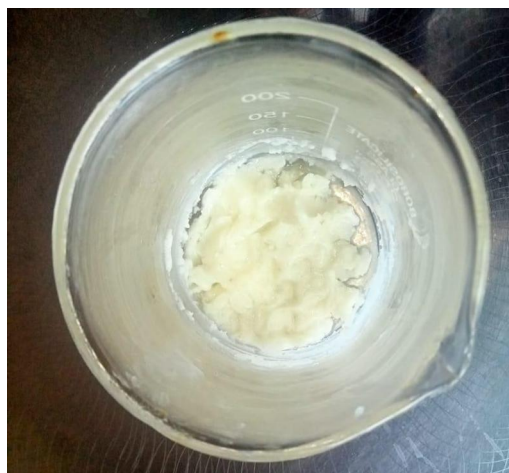
Fungi usually make their homes in moist areas of the body where skin surfaces meet: between the toes, in the genital area, and under the breasts. Common fungal skin infections are caused by yeasts (such as *Candida* or *Malassezia furfur*) or dermatophytes, such as *Epidermophyton*, *Microsporum*, and *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. These eruptions (dermatophytids, or identity or id reactions) are allergic reactions to the fungus. They do not result from touching the infected area.

Symptoms:

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

Causes of fungal skin infection :

- due to use of antibiotics
- hormone imbalance
- poor eating habits



Diagnosis:

Doctors may suspect a fungal infection when they see a red, irritated, or scaly rash in one of a fungal skin infection by scraping off a small amount of skin and having it examined under a microscope or placed in a culture medium where the specific fungus can grow and be identified.

Treatment :

Antifungal drugs

Measures to prevent moisture

Fungal infections are typically treated with antifungal drugs, usually with antifungal drugs that are applied directly to the affected area (called topical drugs). Topical drugs may include creams, gels, lotions, solutions, or shampoos.

Antifungal drugs may also be taken by mouth

In addition to drugs, people may use measures to keep the affected areas dry, such as applying powders or wearing open-toed shoes.

For some infections, doctors give corticosteroids to relieve inflammation and itching.

Cream:

Definition- "Cream is semisolid preparation of a medication for topical use (on the skin) that contains a water base. Essentially, it is a preparation of oil (often lanolin or petrolatum) in water. "An ointment is preparation for topical use".

Antifungal cream: "Cream which is used for destroying fungi or inhibiting their growth"

Advantages of Cream: able to calm inflammation Promote skin tone

Keep wrinkles and acne away

Increase cell metabolism and blood circulation Easily water washable. Easy to wipe away.

Less greasy compared to ointment.

Easy to spread on the skin's surface (i.e. easy to apply). Suitable for sensitive, dry, and fair skin

Suitable for acute lesions

Disadvantages of Cream:

Stability is not as good as ointment

They are less hygroscopic than other semi-solid preparation, so risk of contamination is high than other.

Less viscous than other semi-solid preparation

Review of literature:

A. 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 treatment of skin infection.

Amulyaratna behera & Sumit kumar sahuo-(Jun 2012). This research paper consist of: GB- loaded PLGA NPs were prepared by solvent evaporation technique using methanol/dichloromethane(2:1) & characterize by transmission electron microscopy(TEM), and differential scanning calorimetry((DSC). effect of stirring 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.

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. The majority of existing creams which has prepared from drug of synthetic origin, such as acyclovir, triamcinolone, calcipotriene, mometasone, extracts gives fairne effects, without side effects it gives the

fairness look to skin. ss to face, but it has several side effects such as itching or several allergic reactions. Herbal cream do not have any of these side

AIM: To formulate and evaluate antifungal cream from herbal ingredient.

OBJECTIVE

The objective of this research work was to formulate the cream which does not cause side effects or adverse reaction.

To study efficacy and safety of prepared antifungal cream.

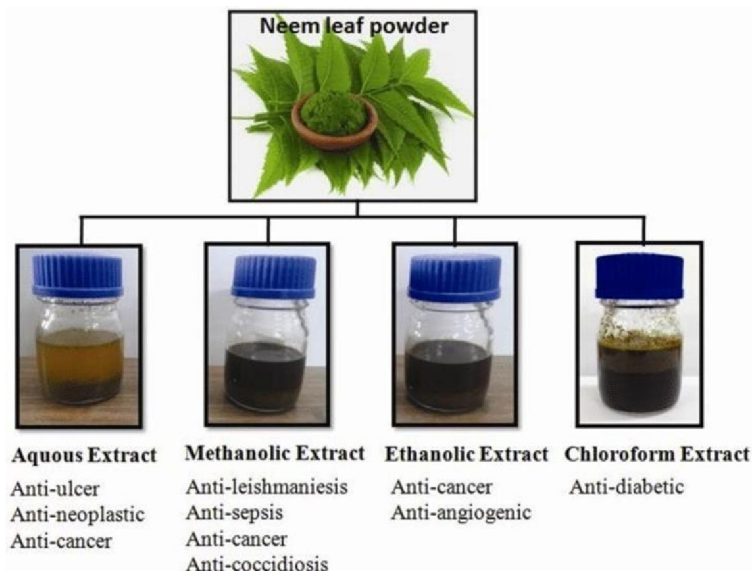
PHYTOCHEMISTRY OF HERBAL DRUG: Herbal ingredient used: neem leaves



Synonyms : hin.-nira, nimb; mal.- veppa; mar.- limba, oriya-nimba; team-vembu.

Biological source : neem consist of the fresh or dried leaves and seed oil of azadirachata irachtalinn.

Family: Meliaceae .



Macroscopical characters :

1* leaves:

They are imparipinnate, alternate, exstipulate, 3-6cm long on long slender petioles; leaflets 7-17; alternate or opposite, very shortly stalked, 1-15 cm long.

Colour : smooth and dark green.

Odour : typical

Taste : bitter.

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Apex: ovate- lanceolate, attenuate.

2* fruits

Shape : ovoid, smooth drupe.

Colour :green [young and unripe], yellow to brown [mature and ripe.

3 * seed oil

Colour :yellow to brown.Taste : bitter .

Odour : garlic.

Chemical constituent :

Neem shows therapeutics role in health management due to rich source of various types of ingredients. The most important active constituent is azardirachtin and the other are nimbolinin , nimbin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin, and quercetin.

Uses of neem :

* Increases immunity

*Moistures skin

*Improves digestion

*Oral health

*Promotes hair growth

*Antifungal and anti bacterial

*Blood purification

Excipient profile :

Formulation and composition of antifungal and anti-inflammatory cream

Components	Amount (g)
Active ingredient	1% cream (20)
Aqueous neem leaves extract	1
Oily phase	
Stearic acid	2.2
Cetyl alcohol	0.8
Liquid paraffin	0.8
Aqueous phase	
Water	14.7
Glycerin	1.0
Triethanolamine	0.3
Methylparaben	0.2

Experimental work :

Formulation preparation :

Formulation of anti-fungal cream

The formulation and composition of the cream were shown in Table 1. The oil phase and water phase were taken in separate beakers and heated up to 70°C. The oil phase was added in water phase with continuous stirring till oil-in-water is prepared. The cream is formed when the consistency is good and the appearance is opaque. 1% and 2% of aqueous neem leaves extract. Calabura leaves extract were mixed with the base along with methylparaben which is a preservative.

The following parameters were used Evaluation of formulated cream to evaluate the anti fungal cream .

Composition of cream:

Components	Uses
Oily phase	
Stearic acid	Lubricating agent
Cetyl alcohol	Emulsifier
Liquid paraffin	Dry skin treatment
Aqueous phase	
Water	Vehicle
Glycerin	Lubricants
Triethanolamine	Herbicide
Methylparaben	Anti fungal agent

Evaluation of cream:

Physical Properties: The Cream was observed for colour, odour and appearance.

Physical Property.

1 Colour:	Pale white
2 Odour:	Characteristic
3 Appearance:	Semi-Solid

Stability studies-stability testing of the formulated cream showed a stable and good appearance.

Stability Test.

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

pH test : the ph of cream of the present invention with a functional biopolymer such as chitosan ,and antifungal agent is form about 3 to 6



Spredability :

The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load.

Lesser the time taken for separation of the two slides better the spreadability.

Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer.

Spread ability= $m \times 1/t$

Where,

M= standard weight which is tied to or placed over the upper slide (10g) l= length of glass slides (7.5cm)

t= time taken in second (7 sec)

Result and discussion:

A majority of the worlds population in deveolging countries still relies on herbal medicine to meet its health nedds and because of this extensive research is now being carried out in this area.

a) The stability studies of the various parameters like visual appearance ,nature , ph of the formulations showed that there was no significant variation after two weeks of the study peiord and the results are summarised .

b) The ph of the prepared cream with the extract was found to be around 6 which is suitable for topical applications because the skin is between 4.5-6. Results are summerised.

c) The formulation of cream shows no redness, edema, inflammation and irritation during test studied. These formulation are safe to use for skin.

d) The spreadability studies showed that formulatin have better spreadability are summarized

II. CONCLUSION

The present work focuses on the potential of herbal extracts from cosmetic purposes. The uses of cosmetics have been increased in many folds in personal care system . the use of bioactive ingredient in cosmetics influences biological functions of skins and provide nutrients necessary for the healthy skin. The prepared formulations showed good spreadability , no evidence of phase separation and good consistency during the study period. Stability parameters like visual apperance , nature variations durings the period and fragrance of the formulations showed that there was no significant changes durings study period.

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