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Research Article

Research Article on Formulation and Evaluation of Nimbidin Herbal Cream

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ABSTRACT

Vitiligo is a chronic, idiopathic disorder that affects skin pigmentation and can significantly impact the social lives of those affected. The primary symptom of vitiligo is the appearance of white patches or lesions on the skin. Notably, some cases have shown partial re-pigmentation of de-pigmented skin after four months, indicating a reversal in disease progression. The aim of this study is to formulate and evaluate an herbal cream using neem extract and curcumin extract for the treatment of vitiligo. The cream is composed of a base that includes emulsifying wax, beeswax, stearic acid, glycerin, vitamin E oil, citric acid, distilled water, neem extract, and curcumin extract. The cream was prepared using the extemporaneous method to achieve a smooth texture and ensure proper mixing of all ingredients. The neem extract was prepared using alcohol as a solvent, taking advantage of neem's antibacterial properties. Additionally, neem leaves are known to promote melanin production in the skin. The curcumin extract was also prepared using alcohol as a solvent.

INTRODUCTION

Vitiligo is a challenging and often distressing disorder that affects skin pigmentation by destroying melanocytes, the cells responsible for producing skin color. It impacts approximately 1% to 2% of the global population and is characterized by the development of milky-white patches on the skin, commonly found on the hands and face. This condition can occur in both males and females, as well as in children and adults, and is often linked to a positive family history. Recent research has significantly advanced our understanding of the pathogenesis of vitiligo, which is now classified as an autoimmune disorder influenced by genetic and environmental factors. Neem has been utilized in traditional medicine for centuries due to its remarkable ability to treat various skin diseases, including psoriasis, leukoderma, and leprosy. Recognized as one of the oldest remedies for

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leukoderma, neem has been extensively used by practitioners of both Indian and Western medicine. Every part of the neem plant—its stems, roots, seeds, leaves, and flowers—holds therapeutic value and is employed to address a variety of skin issues, including leukoderma, skin rashes, and infections. The active components of neem are primarily isolated from its leaves and are considered therapeutically beneficial. Neem is typically used both topically and orally, often in the form of ointments or pastes, particularly in regions characterized by dry and hot climates. Vitiligo is a long-term skin condition characterized by the loss of pigment in certain areas of the skin, resulting in white patches. It occurs when melanocytes, the cells responsible for producing melanin (the pigment that gives skin its color), are destroyed or stop functioning.

Drugs and Excipients Profile:

1. Neem tree:

Botanical name: Azadirachta indica

Synonyms: Neem tree, Nim tree, Margosa, arishth, Azadirachta indica, Melia Azadirachita Tree.

Chemical constituents: Nimbin, Nimbidin, Nimbanene, 6-desacetylnimbinene, Nimbandiol, Nimbolide, Ascorbic acid, n-hexacosanol.

Taxonomical classification: Cyclic Trisulphide, Cyclic Tetrasulphide, Polysaccharides.

Kingdom – Plantae

Order-Sapindales

Family - Meliaceae

Genus-Azadirachta

Species - Azadirachta indica

Fig 1: Neem tree

Uses:

1. Immunomodulatory Effect

Vitiligo is often linked to autoimmune responses. Neem helps modulate the immune system, potentially reducing the immune attack on melanocytes (the pigment-producing cells).

2. Anti-inflammatory Properties

Neem contains compounds like nimbin and nimbidin that help reduce skin inflammation, which may slow the progression of vitiligo patches.

3. Antioxidant Activity

Rich in antioxidants like quercetin and vitamin E, neem helps protect melanocytes from oxidative stress, which is a known trigger for vitiligo.

4. Skin Healing and Regeneration

Neem promotes wound healing and skin regeneration, aiding in the repair of damaged skin and possibly supporting repigmentation.

Benefits of Neem: Nimbidin- Antiseptic and anti-inflammatory, increases melanin level.

2. Curcumin:

Botanical name**:** curcuma longa

Synonyms: curcuma domestica, turmeric.

Chemical constituents: demethoxycurcumin, bis-demethoxycurcumin.

Taxonomical classification**:** Curcuma longa

Kingdom- Plantae

Order- Zingiberaceae

Family-Zingiberaceae(ginger family)

Genus- Curcuma

Species – curcuma longa

Fig 1: Curcumin

Uses:

1. Stimulates Melanogenesis (Melanin Production)

Curcumin may help stimulate melanocyte activity (the cells that produce melanin), potentially aiding in repigmentation of the skin.

It may work better when combined with phototherapy (like UVB) or other herbs like psoralen (from Psoralea corylifolia).

2. Anti-Inflammatory Effects

Vitiligo is partly considered an autoimmune condition.

Curcumin inhibits inflammatory cytokines like TNF-α and IL-6, helping reduce autoimmune attack on melanocytes.

3. Antioxidant Activity

Curcumin neutralizes free radicals, which can damage melanocytes.

Protects skin from oxidative stress, a known factor in vitiligo pathogenesis.

Benefits of Curcumin: Antioxidant protection, anti-inflammatory effect.

Ingredient:

Emulsifying wax- Improve texture and spreadability.

Beeswax- Thickening agent.

Steric acid - Thickening agent, Enhances cream stability.

Glycerine- Deep moisturization.

Aloe vera gel- Smoothing agent.

Vitamin E oil- Antioxidant.

Citric acid- Preservative.

Perfume- Smell agent.

Distilled water-Vehicle.

Method of preparation:

1.Extraction:

Steps carried out in the preparation of vitiligo herbal cream were as follows-

- Neem powder (5gm) + alcohol (25ml) kept in air tight container (5 days) for maceration. (Alcoholic Extract Preparation)
- curcumin (3gm), alcohol (15ml) kept in air tight container (5 days) for maceration. (Alcoholic Extract Preparation)

Fig.no.6. Extraction process

2.prepare the oil Phase:

in a heat-resistant beaker, Combine Neem Powder, curcumin Powder, Emulsifying wax, and Beeswax, steric acid (if using).

Add aboute 2-3g to of here to the mixture to help disperse Powders and ensure they The Powders and ensure they don't clump.

Gently heat the oil phase. mixture to 70°C in a double boiler or water bath, Stirring occasionally Completely until the waxes are completely melted. and the mixture becomes uniform.

3.prepare the water Phase:

in a separate beaker, heat distilled water around 70°C.

Add the remaining glycerin (2-3g) to the water and Stir well to ensure it dissolves.

If you are using Aloe vera gel, you Can eithe add it here (if in liquid liquid Form) or incorporate it in the Cool down Phase.

Fig.no.7.Oil and Water phase

4. Combine the phases:

Slowly Pour the oil phase into the water phase while ' Continuously an Stirring or using immersion blender. to Form an emulsion.

Blend well until the cream thickens and becomes Smooth and uniform. using an immersion blender can' help ensure that the neem Powder and Curcumin powder are evenly distributed throughout the cream. the mixture Should be free of lumps.

Fig.no.8. Combine phase

5. Cool down Phase:

once the mixture. has Cooled to below 40°C and add Vitamin E oil and the Preservative.. Stir gently to incorporate these ingredients.

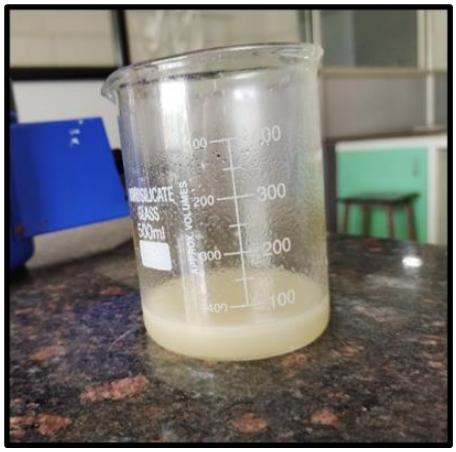

Fig.no.9. Cool down phase

6. Storage:

Transfer the finished cream into a Sterilized jar or container for Storage Store in a cool, dry place.

Fig.no.10.store cream

FORMULATION TABLE:

Table.no.1.Formulation table

Ingredient	Function	F1	F2	F3
Neem	Increase Melanin	5gm	3gm	3gm
Turmeric	antioxidant	3gm	1gm	2gm
Emulsifying	Improve texture and spreadability	2.5gm	2.5gm	5gm
Bees wax	Thicken the cream	4gm	2gm	2gm
Stearic acid	Thickening agent, enhance cream stability	2gm	2gm	3gm
Glycerin	Deep moisturization	5ml	5ml	5ml
Aloe vera gel	Smoothing agent	5ml	5ml	5ml
Vitamin E oil	Antioxidant	1ml	1ml	1ml
Citric acid	Preservative	1gm	1.5gm	1.5gm
Perfume	Smell agent	q. s.	q. s.	q. s.
Distilled water	Vehicle	q. s.	q. s.	q. s.

EVALUATION PARAMETERS:

Evaluation of Vitiligo herbal cream includes following parameters:

Determination of organoleptic properties - The appearance of the cream was judged by its color, pearlscence and roughness and graded.

PH - The pH meter was calibrated and measured the PH by placing in the beaker containing 20mg of the cream

Homogeneity- test was done by physical touch with hands.

Appearance - The appearance of the cream was found by observing its color, opacity. etc.

Determination of emolliency - Emolliency slipperiness and amount of residue left after the application of fixed amounts of cream was checked.

Smear Type - The test was conducted after the application of cream on the skin the smear formed was oily or aqueous in nature

Washability - The removal of the cream applied on skin was done by washing under tap water with minimal force to remove the cream.

Irritancy Test - The cream was applied on left hand dorsal side surface of 1 sq.cm and observed in equal intervals upto 24hrs for no irritancy, no redness and edema.

RESULT AND DISCUSSION:

The Vitiligo herbal c cream was prepared by using o/w emulsion method using mixture of alcoholic extract of crude drugs including , Neem leaves, curcumin, The extract were used and formulated and pass all evaluation test and all result were mentioned below.

Appearance:

The cream prepared was found to be of a greenish white color and had pleasant odor.

PH:

The pH of cream was found to be 6.2, which is acidic value.

Homogeneity:

It was found that the cream was homogeneous and smooth and consistent in nature

Raboutness:

It was found that the cream was easily spreadable and moisturizes the skin surface of human volunteer.

Evaluation Parameter:

Table.no.2. Evaluation Parameter:

Sr. No.	Parameters	Obsevation
1.	Colour	White
2	PH	6.2
3	spreadability	Easily spreadable
4	washability	Washable
5	consistency	Good
6	Homogeneity by visual By touch	Homogenous Smooth and consistent
7	Irritancy	No redness

CONCLUSION:

The herbal anti-vitiligo cream, which incorporates extracts of neem and turmeric, has been successfully developed and thoroughly evaluated. The final product was assessed for its appearance, texture, pH, thermal stability, and overall stability to ensure its safety. Herbal products are more suitable than those based on chemicals. However, further research and testing are necessary to confirm the efficacy and potency of the cream. Pre-clinical and clinical trials are required to gain a better understanding of its effectiveness. This study emphasizes the potential of using natural ingredients in skincare products and encourages further exploration in this area. Additionally, market studies and continuous refinement of the formulation may enhance its commercial viability and promote its widespread adoption for skin health and well-being.

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