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FORMULATION AND EVALUATION OF ANTI FUNGAL HERBAL GEL CONTAINING NEEM AND LANTANA CAMARA EXTRACT

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ABSTRACT:

Herbs have been used as medicine since the ancient period. It is widely used in India. The project work is to formulate and evaluate a gel containing neem and lantana camara extract. The extract was formed into the gel using carbazole 634 by continuous stirring and evaluated for its physicochemical properties such as pH, viscosity, etc. The formulation of Neem and Lantana shows no lumps and has proper color dispersion. It was also observed that the formulation also has easy washability and spreadability. The antifungal activity of Lantana Camara and Neem using MINIMUM INHIBITION CONCENTRATION was carried out. The ethanolic extract of Neem and Lantana was prepared using Soxhlet Extraction. The results concluded that the extract of Neem (*Azadirachta Indica*) and Lantana Camara is an Appropriate formulation for the topical application

KEYWORDS:

Lantana Camara, Herbal Gel, Antifungal test, Evaluation test

INTRODUCTION

Azadirachta indica (Neem), belonging to the Meliaceae family, and *Lantana camara*, from the Verbenaceae family, have been documented to exhibit antimicrobial and fungicidal properties. These primary herbs offer therapeutic benefits without adverse side effects, presenting effective remedies suitable for all age demographics. The utilization of multiple herbs in a single formulation is referred to as polyherbal formulation. Extensive research has been conducted on such formulations, often in conjunction with a variety of other herbal medications, to explore their efficacy and potential applications in treatment protocols. A gel is a semi-solid that can have properties ranging from soft and weak to hard and tough. Gels are defined as a substantially dilute cross-linked system, which exhibits no flow when in the steady state, although the liquid phase may still diffuse through this system. Topical gels represent a class of dermatological drug delivery systems prevalently employed

in both cosmetic applications and the treatment of cutaneous disorders. Their preferential use over conventional creams and Gels is attributed to their distinctive physicochemical advantages. These semi-solid systems are typically constituted by a colloidal dispersion comprising a gelator, a solvent medium, an active pharmacological agent, and various excipient entities. Based on the nature of the gelator, topical gels can be dichotomized into organogels, which are lipid-based, and hydrogels, which are water-based. The formulation and methodological approach to the preparation of these gels are intrinsically governed by the physicochemical characteristics of the gelators, solvents, active drugs, and excipients involved in the system.

AIM AND OBJECTIVE

1)AIM:

Evaluation and Formulation of Antifungal Gel by using Neem leaves and Lantana Camara Extract

2)OBJECTIVE:

A)To protect skin from fungal infection

B)Prevention of Acne

C)To kill the growth of fungi

D)To stop the growth of fungi

SOURCE:

The leaves of Lantana Camara and Neem was collected from the roads of Pune,Maharashtra

METHOD OF PREPARATION:

Leaves of the respective plants were harvested and subjected to a thorough cleansing process using distilled water, followed by a desiccation period under shade conditions for a duration spanning four to five days. Post desiccation, the foliage was pulverized to a fine powder. Utilizing the Soxhlet apparatus, 15 grams of the powdered leaves from both *Azadirachta indica* (Neem) and *Lantana camara* were subjected to extraction. Ethanol served as the solvent medium, with a volume of 250 milliliters placed within the round-bottom flask (RBF). The RBF was then subjected to heat, either via a hot plate or a heating mantle, instigating the evaporation of the solvent. This extraction process was maintained for a period of six hours. Subsequent to the completion of the extraction, the resultant ethanolic extract was allowed to air dry over a span of two to three days, yielding a green, viscous extract. The final product was then stored in an airtight container, kept in an environment that is both cool and devoid of light to preserve its integrity.



Figure 1: -(Soxhlation process)

FORMULATION TABLE OF HERBAL GEL:

Sr.No	Ingredients	Quantity	Use
1	Lantana Camara	1.8ml	Antifungal
2	Neem	1gm	Antifungal
3	Carbapol 934	1gm	Thickening agent
4	Sodium Benzoate	0.3gm	Preservative
5	Propylene Glycol	5ml	Emulsifying agent
6	Triethanolamine	1.2ml	Neutralizer
7	Distilled Water	Q.S	Vehicle

PREPARATION OF HERBAL GEL:

An aliquot of 1 gram of Carbopol 934 was uniformly dispersed in 25 milliliters of distilled water and set aside to allow for hydration and expansion of the polymer for a period of 30 minutes. During this interval, vigorous agitation was employed to facilitate the formation of a homogenous gel matrix. Concurrently, a measured quantity of sodium benzoate (0.3 grams) was solubilized in 5 milliliters of distilled water through the application of heat on a water bath. Upon reaching room temperature, the solution was augmented with 5 milliliters of propylene glycol.

Subsequently, 1.8 milliliters of Lantana camara leaf extract was incorporated into the aforementioned mixture, and the total volume was brought to 50 milliliters by the addition of the residual distilled water. The amalgamation of all components was executed with continuous stirring to ensure uniform dispersion within the Carbopol 934 gel base. Titration with triethanolamine was performed dropwise to the formulation to achieve a skin-compatible pH range of 6.8 to 7.0. The process was continued until the gel attained the desired consistency.

EVALUATION PARAMETERS:

The tone of the text formal and professional provides a detailed overview of the processes involved in evaluating a herbal Gel, focusing on various physical parameters like color, odor, consistency, pH, viscosity, spreadability, washability, non-irritancy test, stability study, and in vitro antimicrobial studies. The language used is technical and precise, highlighting the importance of each parameter in assessing the quality and effectiveness of the Gel. The text aims to convey a sense of reliability and expertise in the evaluation process.

1)Colour and Odour:

Physical parameters like colour and odour were visually examined.

2)Consistency:

The texture appeared smooth without any greasiness.

3)pH:

The pH of the prepared herbal Gel was measured using a digital pH meter. A solution of the Gel was prepared with 100ml of distilled water and left for 2 hours. The pH was determined in triplicate, and the average value was calculated.

4)Spreadability:

The spreadability was determined by placing excess sample between two slides, compressing it to a uniform thickness with a specific weight for a set time. The time taken to separate the slides was measured as spreadability. Spreadability was calculated using the formula:

$$S = M \times L / T$$

Where:

S = Spreadability

M = Weight attached to the upper slide

L = Length of the glass slide

T = Time taken to separate the slide

5)Washability:

The formulation was applied to the skin, and the ease of washing with water was assessed.

6)Non-irritancy Test:

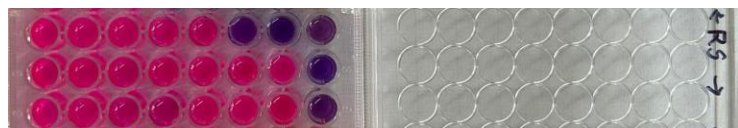
The herbal Gel was applied to human skin and monitored for any adverse reactions.

7)Stability Study:

A stability test of the herbal Gel was conducted over four weeks at various temperature conditions - 2°C, 25°C, and 37°C. The Gel was found to be physically stable at these temperatures within the four-week period

8)In vitro Antimicrobial Studies:

Antifungal activity was determined using the MINIMUM INHIBITION CONCENTRATION, and the diameter of inhibition Tone Analysis

**9)Washability:**

The formulation was applied to the skin, and the ease of washing with water was assessed.

10)Non-Irritancy Test:

An herbal Gel was applied to human skin and observed for any adverse effects.

11)Stability Study:

The stability test of the herbal Gel was conducted for four weeks at different temperature conditions (20oC, 25oC, 37oC). The Gel was found to be physically stable at all tested temperatures within four weeks.

RESULT:

The Herbal Gel was prepared and evaluated. Neem and Lantana Camara extract were obtained using Soxhlet Extraction

PHYSICOCHEMICAL EVALUATION:

Physicochemical Parameter	Observation
Colour	Light Green
Odour	Characteristic
Consistency	Smooth
pH	5.14
Spreadibility	Well spread

CONCLUSION:

The present study concludes that the phytotherapeutic formulation comprising Lantana camara extract and Azadirachta indica (neem) powder gel exhibits satisfactory physicochemical attributes. While herbal cosmetics are generally perceived to be safe for extended use, rigorous quality control measures are essential to ascertain their efficacy and safety. Such measures are imperative for these preparations.

The topical administration of gels at sites of pathology confers significant benefits, notably the expedited release of pharmacological agents directly to the target area, surpassing the performance of creams and ointments. In contemporary practice, gels are increasingly employed as a medium for the topical conveyance of medications. The incorporation of plant and herb extracts, renowned for their medicinal virtues, as active constituents in this dosage form, augments its therapeutic value.

The antimicrobial efficacy of the gel formulation was substantiated through antibacterial assays against Staphylococcus aureus and Staphylococcus epidermidis. The outcomes suggest the necessity for further investigative studies to elucidate the specific contributions of each phytoconstituent to the antimicrobial activity. Consequently, the research corroborates the potent antimicrobial properties of the herbal gel formulation.

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