Formulation And Evaluation ofMultipurpose Herbal Cream

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Abstract- The treatment of numerous skin conditions, neem, aloe vera, and tulsia lso known as holy trees and herbs have been used since ancient times. A polyherbal cream was made in this study by combining a variety of substances with the leaves of Tulsi (Ocimum sanctum) and Neem (Azadirachta indica). The Amravati Local Area was the source of the neem, aloe vera, and tulsi leaves. Using a mixer grinder to reduce the size of the plants to a coarse powder, they were shade dried for four days and then sieved through number 22. To be used in future research, the coarse powder was preserved. Ethanol was used in a soxhlet device to extract neem and Tulsi leaf after they had been defatted with pet ether 60-40.

A total of 500 millilitres of ethanol and 100 grammes of plant material were used in the three-hour extraction process. The extract was dried in a rotary evaporator, and the resulting ethanol extracts were stored in a desiccator for later research. The extracts were combined with different components and excipients to create a polyherbal cream. A number of assessment measures, such as pH, viscosity, spreadability, accelerated stability tests, spectrophotometric test, centrifugation test, and microbial stability, were used to assess the cream. In a stability chamber, the accelerated stability tests were conducted over the course of 20 days at both room temperature and higher temperatures. After centrifugation, a stability investigation revealed that the cream was stable and that no phase separation had occurred. E. Coli and yeast growth were used to assess the microbiological stability. The outcomes showed that there was no microbial growth in the cream's microbiological stability.

Keyword- Azadirachta indica, Ocimum sanctum, Aloe vera, Evaluation, Poly Herbal, Stability.

I. INTRODUCTION

Cream is defined as semisolid emulsions of the water in oil (w/o) or oil in water (o/w) type that are meant to be applied externally. Cream is divided into two categories: water in oil emulsion and oil in water. Its primary function is to stay longer at the application site when applied to the outer or superficial layers of the skin.

1.Physiology of normal skin

The skin is composed of three layers,

1.Epidermis (50–100 μm)2.Dermis (1–2 mm)

3.Hypodermis (1–2 mm)

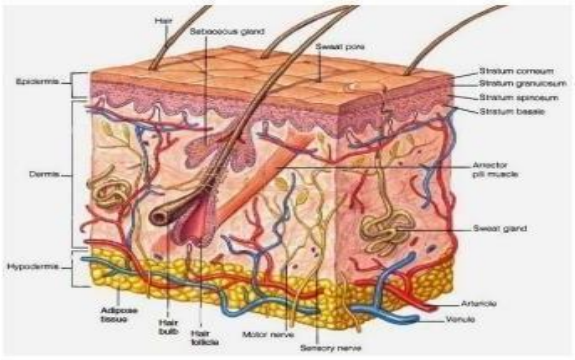

Fig.1: Atomical layers of the cutaneous tissue.

The most superficial layer of the epidermis, the stratum corneum, contains the barrier to percutaneous absorption. In general, the stratum corneum serves as a permeability barrier to the environment, minimises water loss, and offers defence against microbes and abrasive action. A multilayer layer of flat, polyhedral-shaped, 2–3 μm thick, non-nucleated cells called corneocytes makes up the stratum corneum, which has a thickness of 10–20 μm. The main component of corneocytes is insoluble bundled keratin, which is encased in a cell envelope stabilised by covalently attached lipids and cross-linked proteins. Membrane connections known as Corne desmosomes link corneocytes and support the cohesiveness of the stratum corneum. Lipids derived mostly from lamellar body exocytosis during keratinocyte terminal differentiation make up the intercellular gap between corneocytes. A healthy skin barrier function depends on these lipids.[1]

There are 10–20 layers of cells that make up the epidermis. Melanocytes, which are involved in skin colouring, and Langerhans' cells, which are involved in antigen presentation and immunological responses, are also found in this pluristratified epithelium. Like any other epithelium, the epidermis gets its nourishment from the dermal vascular network. The

epidermis is a dynamic structure, and intricate regulatory systems of cellular differentiation govern the regeneration of the stratum corneum. The following investigations of the epidermal reactions to disruptions of the skin barrier have provided current understanding of the function of the stratum corneum:

1. Extraction of skin lipids with apolar solvents.
2. Physical stripping of the stratum corneum using adhesive tape.
3. Chemically induced irritation.[2]

Table 1: Ingredients used in formulation of Multipurpose Herbal Cream.

Sr. No.	Ingredients	Role of ingredients
1	Aloe vera	Anti-ageing, anti-inflammatory, moisturizer, reduce acne and pimples
2	Neem	Antibacterial, adds glow to the face.
3	Tulsi	Relieves skin dryness, itching and redness.
4	Beeswax	Emulsifying agent, stabilizer and gives thickness to the cream
5	Liquid paraffin	Lubricating agent
6	Methylparaben	Preservative
7	Borax	Alkaline agent which reacts with emulsifying agent to form soap

II. MATERIALS AND METHOD

Collection of plant material

Aloe vera, tulsi (Ocimum sanctum), and neem (Azadirachta indica) leaves were gathered from the nearby amravti area.

Extraction of neem leaves

The leaves of neem were gathered, cleaned in distilled water, and then dried in a hot air oven. Leaf powder was produced after adequate drying. Next, at 80–100 degrees Celsius, 5g of powdered neem leaves. Using a mechanical shaker, dimethyl sulfoxide was placed in a volumetric flask and agitated for three days. The mixture was next heated to between 80 and 100 °C on a water bath, concentrated to a volume of 20 milliliters, and filtered through muslin fabric to get rid of any remaining contaminants. Subsequently, the procedure employed the filtrate or filter product, which is a transparent solution or extract derived from Neem leaves.

Fig.3 Neem leaves.

Extraction of aloe vera

Fresh, healthy, and mature aloe vera leaves were selected, then they were cleaned with distilled water. After the leaf had properly dried in a hot air oven, the outer portion was cut longitudinally with a sterile knife. The colorless parenchymatous tissue that makes up aloe vera gel was then removed using the sterile knife. Then, muslin cloth is used to filter out the pollutants and fibers. Subsequently, the transparent aloe vera gel known as the filtrate or filter product was employed in the procedure.

Fig.4 Aloe vera.

Extraction of tulsi leaves

The tulsi leaves were gathered, cleaned with distilled water, and then dried in a hot air oven. Upon adequate drying, the leaves were ground into a powder. Then, using a REMI RSB12 mechanical shaker, 1 g of Tulsi leaf powder and 10 ml of dimethyl sulfoxide were added to a volumetric flask and agitated for three days. The solution was then concentrated to 5 ml and filtered through a muslin

cloth to exclude contaminants after being heated over a water bath for a few minutes at 80 to 100 degrees Celsius. Next, the filtrate, or filter product, was prepared using a clear solution or extract of Tulsi leaves.

Fig.5 Tulsi leaves.

III. PREPARATION AND FORMULATION

Heat the liquid paraffin and beeswax in a borosilicate glass beaker to 75 degrees Celsius and maintain that temperature. (Oil Phase) In another beaker, dissolve the borax and methylparaben in distilled water. Heat the mixture to 75°C to get a clear solution. The aqueous phase is this. Next, add this aqueous phase to the heated oily phase gradually.[5] Add a certain quantity of tulsi, neem, and aloe vera gel and stir until a creamy cream forms.

Spread the cream out on the slab and dab in a few drops of distilled water if needed. To give the slab a smooth texture and to fully incorporate all of the ingredients, mix the cream in a geometric pattern. This method is referred to as extemporaneous cream preparation or slab technique.

Table 2: Formula for preparation of Multipurpose Herbal cream.

Sr.No.	Ingredients	C1	C2	C3
1	Aloe vera gel	2.25 ml	1.75 ml	1.25 ml
2	Tulsi extract gel	1 ml	0.75 ml	0.75 ml
3	Neem extract	0.2 ml	0.4 ml	0.6 ml
4	Liquid paraffin	10 ml	12 ml	15 ml
5	Methyl paraben	0.3 gm	0.2 gm	0.4 gm
6	Borax	0.03 gm	0.02 gm	0.04 gm
7	Beeswax	3 gm	3.5 gm	4 gm
8	Distilled water	Q.S.	Q.S.	Q.S.

IV. EVALUATION

1) Physical Characteristics: The color, smell, and look of the cream were noted.
2) Accelerated Stability studies: Drug products undergo stability testing from the start of drug research till the compound or commercial product fails. According to ICH recommendations, stability studies were conducted to evaluate the medication and formulation stability. The ICH guidelines were followed in conducting the stability investigations. Two of the most stable formulations, C2 and C3, underwent accelerated stability testing at room temperature. These formulations were assessed for a period of seven days. They used formulas C2 and C3 and were kept at 40 °C for 20 days. The various parameters were measured on the 0th, 5th, 10th, 15th, and 20th day after the formulations were stored at room temperature and at higher temperatures.[6]
3) pH measurement: A precise weight of 0.5 ± 0.01g of the cream was placed in a 10ml test tube. The cream was added and mixed with 4.5 ml of water. Using the pH meter, the suspension's pH was calculated at 270 C.[7]
4) Irritancy test: Outlined a 1 cm2 region on the dorsal surface of the left hand. Following application of the cream, the time was recorded. Next, for up to 24 hours, it is observed and reported for irritation, erythema, and edema, if present.[8]
5) Washability test: The hand was given a tiny amount of cream and then washed with tap water to assess the washability of the cream. Washing all three of the formulas was simple.[7,8]
6) Spreadability Test: The phrase "spreadability" refers to the region that the cream easily spreads when applied to the skin. A formulation's spreading value affects how effective it is as a medicine. To investigate the formulations' spreadability, a unique device has been created. Spreadability is measured as the "time in seconds" that two slides separated from the formulation and were positioned in between when a specific load

was applied. Better spreadability results from a shorter separation period.

Two glass slides with regular measurements were chosen. One slide contained the formulation whose spreadability was to be ascertained covered with it. Over a length of 5 cm down the slide, the other slide was positioned on top of the formulations and sandwiched between the two. The formulation between the two slides was uniformly squeezed to form a thin layer by pressing a 10 g weight up on the upper slide. The extra formulation sticking to the slides was scraped off once the weight was removed. A stationary slide was utilized to display the formulation. The second movable slide was positioned on top of it, and one end of it was fastened to a string so that a pan and a basic pulley could apply load to it. The time it took for the upper slide to move 5.0 cm and split off from the lower slide in the weight's direction was recorded after a 3g weight was placed on the pan.Next, the spreadability was computed using the formula.[9]

Spreadability= m ×l /t

Where, m = weight tied to the upper slide (3g)

l =length of glass slide (5cm)

t =time taken inseconds

7) Examine microbial growth in formulated creams: Using the streak plate method, the formulated creams were inoculated on agar media plates, and a control was made by leaving out the cream. The plates were put in the incubator and left there for a whole day at 37 0C. Plates were removed from the incubator after the incubation period to assess microbial growth by contrasting it with the control.[10]

Fig.6 photograph showing microbial count.

V.RESULT AND DISCUSSION

1)Physical evaluation

Table 3: Physical examination results

Sr. No.	Physical property	C1	C2	C3
1	Colour	Light green	Light green	Light green
2	Odour	Organic	Organic	Organic
3	Texture	Smooth	Smooth	Smooth

2Accelarated stability study

Table 4: Results of the Accelerated Stability Test.

Test	After one month
Physical appearance	Semi solid
Texture	Smooth
Colour	Light green
Odour	Organic
PH value	6.5
Thermal stability	Stable
Degradation of product	No

3)pH test

Table 5: pH test results.

Sr. No.	Formulation	PH
1	C1	6.4
2	C2	6.7
3	C3	6.6

4)Irritation test

Table 6: Irritation test results.

Sr. No.	Formulation	Irritant effect	Erythema	Edema
1	C1	Nil	Nil	Nil
2	C2	Nil	Nil	Nil
3	C3	Nil	Nil	Nil

5) Washability test

It is simple to wash all three formulations.

6) Spreadibility

The three formulations, C1, C2, and C3, were tested for spreadibility. It was discovered that, for C2, the time it took for the two slides to separate is less. According to the evaluation test description, the better the spreadability, the less time it takes for the two slides to separate, so C2 demonstrated better spreadabilty.

7) Microbial growth test

Using agar medium as a culture, the cream formulations were examined for the presence of pathogenic microorganisms. (Fig. no.6) After a 24-hour incubation period at 370 C, there were no indications of microbial development, and it had more antifungal properties than standard.

VI. CONCLUSION

The use of tulsi, aloe vera, and neem in the lotion demonstrated its multifunctionality. The formulations were stable at room temperature and can be applied to skin without risk, according to the findings and discussion. The creation and assessment of a herbal cream constituted the current task. Since this cream formulation was an o/w emulsion, it could be readily removed with plain water after use. Good viscosity and pH were present in the cream. Throughout the study period, the produced formulations demonstrated high consistency, good spreadability, and no signs of phase separation. Stability characteristics such as the formulations' origin, aroma, and appearance revealed no discernible variation throughout the course of the trial.

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