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## DESIGN AND CHARACTERISATION OF HERBAL FACE CREAM FOR THE TREATMENT OF ACNE AND WRINKLES.

Punnya E P, Noora E, Neeraja Raveendran, Sivakumar R\*

Department of Pharmaceutics, Grace College of Pharmacy, Palakkad, Kerala- 678004, India.

### ABSTRACT

The moisture content present in human skin makes it look young and the use of moisturizer results in fastening the moisture with a surface film of oil. Currently acne and wrinkles are most commonly seen skin problem among the youth. The aim of the study was to prepare and evaluate herbal based moisturized cream for the treatment of acne and wrinkles with additional benefit of moisturize the skin. Totally six formulations were developed with varying concentration of excipients and herbals. The prepared products were evaluated for appearance, colour, pH, viscosity, spreadability, rheological study, and stability Formulations F3 showed good spreadability. In conclusion, F3 formulation found to be best quality among the other prepared cosmetic formulations.

**Keywords:** *Aloe vera*, Neem, Rose Petal, Sandal wood oil, Herbal Facial Cream, Acne, Wrinkles

### INTRODUCTION

Cosmetic products are used to protect skin against exogenous and endogenous harmful agents and improve the beauty and attractiveness of skin [1]. The cosmetic products are the best choice to reduce skin disorders such as skin aging, skin wrinkles, hyper pigmentation and rough skin texture etc. Various synthetic compounds, chemicals, dye and their derivative proved to cause various skin diseases having numerous side effects [2].

Herbal cosmetics are becoming common in the field of beauty, fashion. Herbal cosmetics are the preparations used to enhance the human appearance. "Herbal cosmetics" the demand for herbal medicines is increased rapidly due to their lack of side effects. The herbal cosmetic is purely made by herbs and shrubs [3].

*Aloe vera* is a natural product that is now a day frequently used in the field of cosmetology. It can be applied topically as an emollient for burns, anti wrinkles, sunburn, mild abrasion, and inflammatory skin disorders. It has antibacterial, antifungal, antiviral, antioxidant, and anti-inflammatory effects. Additionally Rose petals, sandal wood, Neem has significant anti wrinkles and acne property

Creams are semisolid emulsions which are oil in water [o/w] or water in oil [w/o] type and these semisolid emulsions are intended for external application. It softens skin, leaving nothing behind [4].

Acne is a most common skin disorder caused by *Acne vulgaris* that affect areas containing the largest oil

gland, including the face, back, and trunk. It is generally characterized for formation of inflammatory lesions. Microbes such as *Propionibacterium acnes* and *Staphylococcus epidermis* have been recognized as pus-forming bacteria triggering an inflammation [5].

The wrinkle is a furrow on the skin surface. It is due to a progressive collagen loss, causing a low elasticity of the tissue and to a lower cellular reproduction. The problems are due to the individual genetic background and life style of the person [6-7]. Considering the above factors the present research was to formulate and evaluate the herbal cream for moistening, nourishing, skin lightening and treatment of acne, wrinkles.

### Materials and Methods

Stearic acid, lanolin & triethanolamine (Spectrum Reagents and Chemicals, Cochin), Methyl and Propyl paraben (Rolex Chemica, Mumbai) Glycerin and Eosin yellow (Isochem Laboratories Cochin), Lavender oil (Yucca Enterprises, Dombivli), Peppermint oil (Technico Laboratory Products, Coimbatore), Neem, *Aloe vera*, Orange powder, Rose powder and Sandalwood powder (Laam Herbal's, Mumbai). All the reagents and chemicals were of analytical grade.

### Preparation of Herbal Cream

All the required ingredients of vanishing cream were weighed and keep separately. Stearic acid and lanolin was

taken in a beaker and melted at 60° C. In another beaker glycerin, triethanolamine, water was added and heated at 60° C. followed by slow addition of herbal ingredients into aqueous phase with stirring. The oily phase was added into aqueous phase slowly with continuous stirring to produce cream. Finally add sufficient quantity of preservatives and perfumes and packed in a wide mouth container. (Table 1)

### Evaluation of the Cream

All the results are presented in Table 2 & 4

#### Physical Characterization

Color, odor and appearance of the cosmetic cream were observed visually.

#### Thermal Stability

Thermal stability testing of prepared formulations was conducted at room temperature, studied for 7 days. They were formulation number 4 and 5 at 40°C± 1°C for 20 days. The formulations were kept both at room and elevated temperature and observed on 0<sup>th</sup>, 5<sup>th</sup>, 10<sup>th</sup>, 15<sup>th</sup> and 20<sup>th</sup> day [6].

#### Determination of pH

A 1 % of solution was prepared for cosmetic products and evaluated for the pH using pH meter [8].

#### Spreadability

100 g of cosmetic cream products were applied between two glass slides and was compressed to uniform thickness. This was place on a balance Weight was added to the pan. The time required to separate the two slides was recorded [6-8].

$$\text{Spreadability} = m \cdot l / t$$

m = Weight tide to upper slide

l = length moved on the glass slide

t = time taken

#### Homogeneity

The homogeneity formulation was assessed by visualization and by touch [9-10].

#### Viscosity

The viscosity determinations were carried out using a Brookfield viscometer using spindle No. S 64 at 20 rpm at a temperature of 25° C [11-12].

#### Dilution and Dye test

In this test the emulsion was diluted with water to assess the type of emulsion [13-14]. In the dilution test a water soluble red dye solution was mixed with prepared cream and view under microscope [15].

#### Antimicrobial activity

Antimicrobial activity of the cosmetic product was assessed by ditch plate method. A sterile 20 ml of nutrient agar media was prepared and transfer into a Petri plate. Six of 6 cm width ditch were made in the agar plate and the

ditch was filled with tested cosmetic cream *Acne vulgaris* microbial suspension was spreaded on the plate and incubated at 37 C ° for 48 h. The diameter of the zone of inhibition was recorded [16].

#### Acid value

10 gm of cream was taken and dissolved in 50 ml mixture of equal volume of alcohol and solvent ether, then the flask was connected to reflux condenser and heated, until the content was dissolved completely, then add 1 ml of phenolphthalein and it is titrated with 0.1N NaOH, until light pink color appears after shaking the flask for 30 seconds [15].

$$\text{Acid value} = n \times 5.61/w$$

n = amount of NaOH required. w = the weight of the substance.

#### Saponification value

Introduce about 2 g of substance refluxed with 25 ml of 0.5 N alcoholic KOH for 30 minutes, to this 1ml of phenolphthalein added and titrated immediately, with 0.5N HCL<sup>15</sup>.

$$\text{Saponification value} = (b-a) \times 28.05/w$$

The volume in ml of titrant = a

The volume in ml of titrating = b

The weight of the substance in gm = w

#### Rheological studies

Take a fixed quantity 10 g of cream in a 10 ml beaker and keep it for 1 h . The beaker was inclined to one side see whether the cream is liquefied or not. Beaker was shaken to and fro for continuous 5 minutes and assessed for the consistency. The beaker was again tilted and checked for pourability of the cream [16-17].

#### Results and Discussion

All the results are tabulated in the table No 2 & 3. *Aloe vera*, Neem powder and Orange powder are well known medicinal property in the Indian market. Hence these herbals are incorporated into the cosmetic cream for the treatment of acne and wrinkles with additional moisturizing effect.

Physical evaluation was done by testing the color, odor, and appearance of the cream. The cream was found to have pleasant odour, cream was having colour shades like yellow, strawberry pink, peach, tortilla brown, cedar brown, peanut brown.

#### Appearance

The formulation was kept both at room and elevated temperature and observed on 0<sup>th</sup>, 5<sup>th</sup>, 10<sup>th</sup>, 15<sup>th</sup> and 20<sup>th</sup> day for the all valuation parameters. The stability results showed that the formulation was good in appearance

#### pH of the cream

The pH of the cream was found to be in range of 5.6 to 6.8 which is good for skin. All the formulations of cream were shown the pH nearer to skin required.

### Homogeneity

All formulations produce uniform distribution of herbals in the cream. This was confirmed by visual appearance and by touch.

### Spread ability

The spreadability test showed that formulation has good spreadable property. All formulations produce uniform distribution of extracts in cream. This was confirmed by visual appearance and by touch. Under visual inspection of the prepared formulation indicated no lumps and to have uniform colour dispersion, free from any fiber and particle.

### Viscosity

The viscosity of cream was in the range of 18705-20714 cps which indicates that the cream is easily spreadable by small amounts of shear. But F3 and F6 shows

good spreadable property than other formulations. The formulated cream was found to be non-Newtonian. The consistency of the cream doesn't get changed.

### Dye and Dilution test

The results of dye and dilution test indicate that the cream was found to be of the o/w type emulsion by dilution. Hence can be easily washed with plane water that gives better customer compliance

### Antimicrobial activity

The results of disc diffusion for assessment of antimicrobial method showed that the herbal anti-acne moisturizer prepared from the combined plant materials had significant antimicrobial activity. (Fig 1)

### Acid Value and saponification value

The results of acid value of all formulation of cream showed satisfactorily value ranged from 25.7 – 27.3

**Table1. Formula for Herbal Cosmetic Cream**

S. No	Ingredients	F1	F2	F3	F4	F5	F6
1.	Stearic acid	18	18	18	18	18	18
2.	Lanolin	2	2	2	2	2	2
3.	Glycerin	3	3	3	3	3	3
4.	Triethanolamine	1	1	1	1	1	1
5.	Propylparaben	0.02	0.02	0.02	0.02	0.02	0.02
6.	Methylparaben	0.02	0.02	0.02	0.02	0.02	0.02
7.	Aloe vera	1	-	1	-	1	-
8.	Neem powder	-	1	-	1	1	-
9.	Orange powder	1	1	-	-	-	1
10.	Sandalwood oil	1	-	1	1	-	1
11.	Rose oil	-	1	1	-	-	-
12.	Lavender oil	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>
13.	Peppermint oil	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>
14.	Eosin yellow	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>
15.	Distilled water	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>	<i>q.s</i>

**Table2. Results for Evaluation of Herbal Cosmetic Cream**

S. No	Test	F1	F2	F3	F4	F5	F6
1	Color	Yellow	Strawberry pink	Peach	Tortilla brown	Cedar brown	Peanut brown
2	Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
3	Thermal stability	Stable	Stable	Stable	Stable	Stable	Stable
4	Homogeneity	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth
5	Spreadability	14.6	13.3	15	13.3	14	14.4
6	pH	5.5	7.0	6.5	7.0	6.0	5.8

**Table3. Results for Evaluation of Herbal Cosmetic Cream**

S.No	Test	F1	F2	F3	F4	F5	F6
1	Viscosity (CP)	18860	19953	20714	19033	18705	20034
2	Dilution	o/w type	o/w type	o/w type	o/w type	o/w type	o/w type
3	Dye test	o/w type	o/w type	o/w type	o/w type	o/w type	o/w type
4	Acid value	5.6	5.5	6.2	5.5	5.9	6.0

5	Saponification value	27.3	26.8	26.6	26.5	25.7	26.5
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**Table4. Results of Antimicrobial activity of Herbal Cosmetic Cram**

S. No	Organism	Formulation	Zone of Inhibition(mm)
1	Bacillus subtilis	F1	7
2	Bacillus subtilis	F2	6
3	Bacillus subtilis	F3	9
4	Bacillus subtilis	F4	6
5	Bacillus subtilis	F5	7
6	Bacillus subtilis	F6	7

**Fig1. Anti-microbial activity of Herbal Cream****CONCLUSION**

From above discussion it was concluded that on combining the extracts of *Aloe vera*, Rose, Orange, Sandalwood, Neem in different ratio to get multipurpose

effect such as whitening, anti-wrinkle, anti-aging, anti-acne and sunscreen effect on skin. These studies suggest that composition of extracts and base of cream of F3 is more stable and safer; it may produce synergistic action.

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