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Formulation and Evaluation of Herbal Cream from Azadirachta Indica Ethanolic Extract

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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 and evaluate the herbal cream for the purpose of moistening and nourishing the skin. Azadirachta indica is one of the most popular auspicious and well known trees which are more extensively studied for its pharmaceutical and clinical properties. Formulation of Oil in water (O/W) emulsion-based cream was formulated with Azadirachta indica extract. Extract of Neem was obtained by using ethanol as a solvent. The herbal formulation showed good consistency, good spreadibilty, homogeneity, pH, non greasy and no evidence of phase separation. The herbal extract containing cream substantially increased skin elasticity, hydration and decreased the skin melanin.

Keywords: Herbal cream, Azadirachta indica, ethanolic extract, Oil in water, homogeneity, pH.

1. INTRODUCTION

Cosmetic products are used to protect skin against exogenous and endogenous harmful agents and improve the beauty and attractiveness of skin. Cosmetics are not only developing an attractive external appearance, but towards achieving long life of good health by reducing skin disorders. The herbal ingredients present in skin care products that supports the strength to the skin, integrity of skin and texture, moisturizing, maintaining elasticity of skin by reduction of collagen and photo protection etc. This character of cosmetic is due to presence of ingredients in skin care formulation, because it helps to reduce the production of free radicals in skin and manage the skin properties for long time. The cosmetic products are the best choice to reduce skin disorders such as skin aging, skin wrinkling, hyper pigmentation and rough skin texture etc. 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. The value of herbs in the cosmeceutical making has been extensively improved in personal care system and there is a great demand for the herbal cosmetics. Thus we are using herbal cosmetics as much as possible. The basic idea of skin care cosmetic lies deep in the Rigveda, 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, antiseborrhatic, antikerolytic activity and antibacterial etc. The word herbal is a symbol of safety in contrast to the synthetic one which has adverse effects on human health. [1-6]

The Azadirachta indica (Neem) is an evergreen tree native to India, belonging to family Meliaceae were first used in India to treat fungal infection, and skin diseases and it is known as “the village pharmacy” because of its healing versatility. Neem is the multifarious tree with immense potential possessing maximum useful non-wood products, though in the study area Neem remains unutilized. And it has been used in Ayurvedic medicine from ancient years due to its therapeutic properties. The tree is found in worldwide not less than 78 countries. There are approximately more than 16.6 millions of neem trees in India. It has also been used from centuries as anti inflammatory, antifungal, antibacterial, anti tumor activities. [7-11]

The objective of present research work is to prepare Skin care Product that not only moisturizes and softens the skin but also helps in healing of skin lesions and skin cracks. An 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.

2. MATERIALS & METHODS

2.1 Preparation of extracts

The shade dried and coarsely powdered (500 g) Azadirachta indica was placed in Soxhlet extractor, using petroleum ether and then successively extracted with ethanol. The extracts were then concentrated to dryness under reduced pressure and controlled temperature, respectively and then preserved in a refrigerator for further utilization.

2.2 Cream formulation

Oil in water (O/W) emulsion-based cream (semisolid formulation) was formulated.

The emulsifier (stearic acid) and other oil soluble components (Cetyl alcohol, Almond oil) were dissolved in the oil phase (Part A) and heated to 75° C. The preservatives and other water soluble components (Methyl paraban, Propyl paraban, Triethanolamine, Propylene glycol, ethanol extract of Azadirachta indica was dissolved in the aqueous phase (Part B) and heated to 75° C. After heating, the aqueous phase was added in portions to the oil phase with continuous stirring until cooling of emulsifier took place. The formula for the cream is given in table 1. [12-13]

Table 1: Composition of Cream

S. No	Ingredients	Quantity (%)
1.	Ethanol extract of Azadirachta indica	2
2.	Stearic acid	12
3.	Cetyl alcohal	3
4.	Almond oil	4
5.	Methylparaben	0.028
6.	Propylparabens	0.029
7.	Propylene glycol	4
8.	Triethanolamine	Q.S
9.	Water	Q.S

3. EVALUATION OF CREAM

3.1 pH of the Cream

The pH meter was calibrated using standard buffer solution. About 0.5 g of the cream was weighed and dissolved in 50.0 ml of distilled water and its pH was measured.

3.2 Viscosity

Viscosity of the formulation was determined by Brookfield Viscometer at 100 rpm, using spindle no 7.

3.3 Dye test

The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide covers it with a cover slip, and examines it under a microscope. If the disperse globules appear red the ground colorless. The cream is o/w type. The reverse condition occurs in w/o type cream i.e. the disperse globules appear colorless in the red ground.

3.4 Homogeneity

The formulations were tested for the homogeneity by visual appearance and by touch.

3.5 Appearance

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

3.6 After feel

Emolliency, slipperiness and amount of residue left after the application of fixed amount of cream was checked.

3.7 Type of smear

After application of cream, the type of film or smear formed on the skin were checked.

3.8 Removal

The ease of removal of the cream applied was examined by washing the applied part with tap water.

3.9 Acid value

Take 10 gm of substance dissolved in accurately weighed, in 50 ml mixture of equal volume of alcohol and solvent ether, the flask was connected to reflux condenser and slowly heated, until sample was dissolved completely, to this 1 ml of phenolphthalein added and titrated with 0.1N NaOH, until faintly pink color appears after shaking for 30 seconds.

Acid value = n*5.61/w

n = the number of ml of NaOH required.

w = the weight of substance.

3.10 Saponification value

Introduce about 2 gm of substance refluxed with 25 ml of 0.5 N alcoholic KOH for 30 minutes, to this 1 ml of phenolphthalein added and titrated immediately, with 0.5 N HCL.

Saponification value = (b-a)*28.05/w

The volume in ml of titrant = a

The volume in ml of titrate = b

The weight of substance in gm = w

3.11 Irritancy test

Mark an area (1sq.cm) on the left hand dorsal surface. The cream was applied to the specified area and time was noted. Irritancy, erythema, edema, was checked if any for regular intervals up to 24 hrs and reported.

3.12 Accelerated stability testing

Accelerated stability testing of prepared formulation was conducted at room temperature, studied for 7 days. And then the formulation studied at 40ºC ± 1ºC for 20 days. The formulations was kept both at room and elevated temperature and observed on 0th, 5th, 10th, 15th and 20th day for the all Evaluation parameters**. [**14-17**]**

3.13 Spreadability test

Sample was applied between two glass slides and was compressed to uniform thickness by placing 100gm weight for 5minutes. Weight was added to the pan. The time required to separate the two slides, i.e. the time in which the upper glass slide moved over the lower slide was taken as measure of spreadability. [18]

Spreadability =m*l/t

m = Weight tide to upper slide

l = length moved on the glass slide

t = time taken.

3.14 Microbial growth test

The formulated cream was inoculated on the plates of Muller Hinton agar media by streak plate method and a control was prepared by omitting the cream. The plates were placed in to the incubator and are incubated at 37ºC for 24 hours. After the incubation period, plates were taken out and check the microbial growth by comparing it with the control. [19]

4. RESULTS & DISCUSSION

4.1 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 pH. The herbal formulation was shown pH nearer to skin required i.e pH 6.3.

4.2 Viscosity

The viscosity of cream was in the range of 28001 – 27025 cps which indicates that the cream is easily spreadable by small amounts of shear. The herbal formulation was shows viscosity within the range.

4.3 Dye test

The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide covers it with a cover slip, and examines it under a microscope. The disperse globules appear in red color and the ground colorless.

4.4 Homogeneity

The formulation was tested for the homogeneity by visual appearance and by touch, appearance and touch was good.

4.5 Appearance

When formulation were kept for long time, it found that no change in color of cream.

4.6 After feel

Emolliency, slipperiness and amount of residue left after the application of fixed amount of cream was found.

4.7 Type of smear

After application of cream, the type of smear formed on the skin were non greasy.

4.8 Removal

The cream applied on skin was easily removed by washing with tap water.

4.9 Acid value

The acid value results of formulation was shown in table 2, and showed satisfactorily values.

4.10 Saponification value

The saponification value results of formulation was shown in table 2, and showed satisfactorily values.

Table 2: Test applied for acid value and saponification value

S. No.	Parameter	Formulation
1	Acid value	5.7
2	Saponification value	22.3

4.11 Irritancy test

The formulation shows no redness, edema, inflammation and irritation during irritancy studies. These formulations are safe to use for skin.

4.12 Accelerated stability testing

The formulation was kept both at room and elevated temperature and observed on 0th, 5th, 10th, 15th and 20th day for the all Evaluation parameters. The stability results showed that the formulation was good.

4.13 Spreadability test

The spreadability test showed that formulation has good spreadable property.

4.14 Microbial growth test

There were no signs of microbial growth after incubation period of 24 hours at 37ºC and it was comparable with the control.

5. CONCLUSION

From above discussion it is concluded that the prepared formulation showed good spreadability, no evidence of phase separation and good consistency during the study period. From the above study it can be concluded that it is possible to develop creams with herbal extracts. The ethanolic extract of *Azadirachta indica* exhibited strong antibacterial activity. The results of different tests of cream showed that the formation could be used topically in order to protect skin against damage. Natural remedies

are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. So, an herbal cream which is non-toxic, safe, effective and improves patient compliance by the utilization of herbal extracts would be highly acceptable. Further research will carry out to check scientifically the synergistic action of formulation.

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