

FORMULATION, DEVELOPMENT AND EVALUATION OF HERBAL SKIN CARE CREAM

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ABSTRACT

Finding new skin-care products made from natural ingredients has been increasingly popular because they have multiple uses for treating sunburn, hyperpigmentation, and ageing. The formulation and evaluation of a herbal skin care cream was the goal of the current work. Individual herbs are not enough to have the intended therapeutic effect, according to Ayurveda. When it is optimised as a combination of different herbs in a specific ratio, it will have a better medicinal impact with less toxicity. It is observed that the viscosity of the formulations goes on decreasing as the rpm increases an inverse relationship exists between the viscosity and the shear rate. Viscosity is found in the range of 30195 to 31545 cp. Drug content was found within the range of 98 to 99 % for all the formulations. Spreadability of the formulations is found within the range of 11.43 to 12.56 gm.cm/sec. In the formulation use of herbs which possess soothing, moisturizing and healing properties, so the herbal based formulation containing *E. officinalis*, *D. carota* and *C. sativus* is advantageous in delivering the entire drug safely to the skin.

Key words: Formulation, *E. officinalis*, *D. carota* and *C. sativus*, Herbal cream, Formulation, Evaluation

INTRODUCTION

There is a high demand for herbal cosmetics because of the rising usage of herbs in the manufacturing of cosmeceuticals in the personal care industry¹. Cosmetics are substances that are meant to be applied to the human body in order to clean, enhance, promote attractiveness, and change the appearance without altering the body's structure or functions. However, using synthetic chemicals has long been detrimental to both our environment and young people. Multiple synthetic substances, chemicals, dyes, and their derivatives have been shown to induce a variety of skin conditions with numerous adverse effects. As a result, we use herbal cosmetics as frequently as possible¹. The Rigveda, Yajurveda, Ayurveda, Unani, and

homoeopathic systems of medicine all have their roots in the fundamental concept of skin care cosmetics.

These are the goods that contain herbs in extract or crude form. These herbs ought to possess a range of qualities, including antibacterial, antiseptic, antiseborrheic, anti-inflammatory, and antioxidant ones. 2. Cosmetics are created to manage oil production, treat acne, and decrease wrinkles. Formulations including skin protection, sunscreen, anti-acne, anti-aging, and anti-wrinkle products are created for specific skin conditions employing a variety of components, either natural or synthetic³. In contrast to the phrase synthetic, which has harmful consequences on human health, the word herbal is a symbol of safety. . In order to boost the aesthetic and preventive benefits provided by this class of substances, new herbal cosmetic products containing antioxidants that can be given more efficiently are always needed. Finding new skin-care products made from natural ingredients has been increasingly popular because they have multiple uses for treating sunburn, hyperpigmentation, and ageing. Here, we intended to offer a natural skin care product based on herbs, which would serve a number of purposes, including preventing sunburn, photoaging, and hyperpigmentation. The products should be ecofriendly and economically viable. Moreover, the intention is to provide a good cream that can give effective protection to skin and is free from any toxicity and irritation when regularly used and should also be cosmetically acceptable having pleasant odour and should not produce side effects. The aim of present study was preparation and evaluation of skin care formulation containing substances from plant origin.

MATERIALS AND METHOD

Collection and identification of plant material

The fruits of *E. officinalis* were collected from Panna (M.P.) India. The fruits of *D. carota* were collected from Ooty (T.N.) India. The *E. officinalis*, *D. carota* and *C. sativus* were collected in the month of December 2009. The species was identified by the local people during the time of collection and later on authentication was made by Dr. Padma Shrivastava, Professor, Department of Botany, Govt. P.G. College, BHEL, Bhopal India. Vouchered herbarium specimen was prepared and preserved alongwith crude drug sample at the herbarium (BOT/541) of Department of Botany, Govt. P.G. College, BHEL, Bhopal (M.P.), India. The plant materials were shade dried, reduced to coarse powder and stored in airtight container till further use.

Extraction of Plant material

Petroleum ether extract

1 Kilogram of powdered drug was packed in soxhlet apparatus and extracted with petroleum ether (60-80°C) until the extraction was completed which was confirmed by the colour of the siphoned liquid. The extract was filtered while hot, and the solvents were removed by distillation and the last traces of solvent being removed under reduced pressure.

Ethanol extract

The marc left after petroleum ether extraction was dried in hot air-oven below 50°C and packed well in soxhlet apparatus and extracted with ethanol (90%) until the completion of the extraction. The extract was filtered while hot, and the solvents were removed by distillation and the last traces of solvent being removed under reduced pressure. The extracts were weighed and their percentage value was recorded and also the physical appearance and color was evaluated and recorded and thereafter, were stored in refrigerator for further experimental work.

Preparation of cream

The appropriate base was selected from table 1 & 2 and cream was formulated. The various ingredients were weighed accurately. The emulsifier and other oil soluble components were melted in a beaker (Part A) and heated to 75° C. The extract was dissolved in required amount of water and filtered. To the filtrate methyl paraben, glycerol were added and maintained at 75° C. When the temperature of both the phases was 75° C. The aqueous phase was added gradually into oily phase with continuous stirring until cooling of emulsifier took place, and left at room temperature to obtain the required product. The flavoring agent was added when it is hot to obtain herbal cream⁴⁻⁵. The compositions of the herbal cream are given in table 1 & 2.

Table 1: Composition of cream base

Ingredient	Formula %					
	F1	F2	F3	F4	F5	F6
Stearic acid	8	9	9	10	9	10
Cetyl alcohol	3	-	5	4	3	-
Beeswax	5	6	-	-	-	4
Starch	2.5	2.5	1.5	1.5	2.5	2.5
SLS	2	2	1	1	1	1
Almond oil	12	12	12	15	15	15
Glycerol	3	3	3	3	3	3
Methylparaben	0.02	0.02	0.02	0.02	0.02	0.02
Triethanolamine	Qs.	Qs.	Qs.	Qs.	Qs.	Qs.
Water qs	Qs.	Qs.	Qs.	Qs.	Qs.	Qs.

Table 2: Composition of herbal extract based HC cream

Ingredient	Formula %				
	Base	F1	F2	F3	F4
Stearic acid	8	9	9	10	9
Cetyl alcohol	3	-	5	4	3
Beeswax	5	6	-	-	-
Starch	2.5	2.5	1.5	1.5	2.5
SLS	2	2	1	1	1
Almond oil	12	12	12	15	15
Glycerol	3	3	3	3	3
<i>E. officinalis</i>	-	1	2	3	4
<i>D. carota</i>	-	0.5	1	1.5	2
<i>C. sativus</i>	-	0.75	1.5	3	4.5
Methylparaben	0.02	0.02	0.02	0.02	0.02
Rose Oil (Drops)	10	10	10	10	10
Triethanolamine	Qs.	Qs.	Qs.	Qs.	Qs.
Water qs	Qs.	Qs.	Qs.	Qs.	Qs.

Evaluation of cream

The physical properties of each formulation were observed such as odor, color, smoothness and phase separation⁶⁻⁷.

pH measurement

A functional definition of pH is the measurement of the acidity or alkalinity of a solution commonly measured on a scale of 0–14. The pH 7 is considered neutral, with lower pH values being acidic and higher values being alkaline or caustic. Human skin is covered with an acid mantle having an acidic pH but due to frequent washing and use of soap the acidity is lost and hence to normalize the skin, moisturizers used should have an acidic range. Acceptable pH range of moisturizers should be 5–8. To measure the pH, 1 g of each formulation (F1–F6) was diluted with 9 ml of distilled water and then pH was checked using pH meter⁸.

Viscosity measurement

The viscosity of each formulation was measured and compared before and after accelerated test by Brookfield Viscometer at 100 rpm, using spindle no 7⁹.

Selection of a suitable cream base

The pH, viscosity and visualization of physical changing of all formulations were compared for selection of the suitable cream base to prepare herbal cream containing various plant extract.

pH measurement

To measure the pH, 1 g of each herbal cream was diluted with 9 ml of distilled water and then pH was checked using pH meter. pH was determined of each formulation by using pH meter¹⁰ (pH meter Henna industries H198107) pH meter was calibrated before with buffer solutions of pH 4, 7 and 9.

Viscosity measurement

The viscosity of each herbal cream was measured and compared before and after accelerated test by Brookfield viscometer at 5, 10, 20 and 100 rpm, using spindle no 7¹¹.

Spreadability determined of the of formulations

two glass slides of known standard dimensions are selected. Formulation whose spreadability to be determined was place on one slide and then other slide was kept over its top such that the gel is sandwiched between the two slides. The slides were pressed upon each other so as to displace any air present and the adhering gel was wiped off. The two slides were placed onto a stand such that only the lower slide is held firm by the one opposite fangs of the clamp clips and allows the upper slide to slip freely over it by the force of weight tied Tie the 20 gm weight to the upper slide carefully. The time taken by the upper slide to completely detach from the lower slide was noted. The spreadability was calculated by using the following formula¹².

$$\text{Spreadability} = S = m * l/t$$

Value s is spreadability, m is the weight tied to the upper slides, l is the length of glass slide, and t is the time taken.

RESULTS AND DISCUSSION:

A large part of the global population is realizing the valuable contribution of phytoconstituents in cosmetic formulations. There is greater awareness about the harmful effects of UA-A and UV-B radiations on the individual's skin. Continuous exposure to sunlight leads to the production of free radicals which play havoc with the skin. Loss of elasticity, roughness, wrinkling, development of fine lines and in some acute cases even skin cancer are the resulting effects. Herbal cosmetic formulations are an excellent medium to soften this blow to the skin and help it to rejuvenate from the harsh effects of the sun. Supplementing the protection offered by these botanicals with sunscreens can prove quite effective. Herbal based formulation were successfully prepared. In this formulation the different concentration of natural herbal drugs concentration along with different formulation ingredients, were optimized to obtain herbal cream.

In the formulation *pH* was determined the *pH* meter. In the formulations *pH* is found to be around 6.66 to 6.43 so *pH* is found in the range of 6 which is compatible with skin. In case the range of *pH* of the formulation are found in above range of pH 6 so which is not compatible with skin and causes irritation with skin. Rheological properties showed that viscosity is inversely proportional to the rate of shear and thus the system shows pseudoplastic characteristics or behaviour. It is observed that the viscosity of the formulations goes on decreasing as the rpm increases an inverse relationship exists between the viscosity and the shear rate. Viscosity is found in the range of 30195 to 31545 cp. Drug content was found within the range of 98 to 99 % for all the formulations. Spreadibility of the formulations is found within the range of 11.43 to 12.56 gm.cm/sec.

Table 3: Results of evaluation parameters

S. No.	Formulation Code	pH	Spreadibility (gm.cm/sec)	Viscosity (cp)
1	HC1	6.66	12.56	30195
2	HC2	6.67	11.75	31545
3	HC3	6.68	11.43	30723
4	HC4	6.55	12.23	30616

CONCLUSION

The present study features a herbal skin care formulation alleviating sunburn and hyperpigmentation, and thereby improves the appearance of the skin. Here we planned to prepare herbal cream contains combinations of herbal ingredients that are formulated to combat and reduce oxidative stress. This work deals with description, review of literature, evaluation of plant material, *in vitro* release activity of extracts, preparation of herbal cream comprising plant extracts, determination of SPF value and pharmaceutical evaluation of formulations. The Result obtained from all the experimental analysis as a part of project work suggested that it is possible to prepare optimized formulation of Herbal cream. In the formulation use of herbs which posses soothing, moisturizing and healing properties, so the herbal based formulation is advantageous indelivering the entire drug safely to the skin.

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