ejpmr, 2022,9(12), 155-160

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

FORMULATION AND EVALUAION OF ANTI AGING POLY HARBAL CREAM

Iram Jahan*, Jiyaul Hak and Wasim Akhtar

IIMT College of Medical Sciences (Pharmacy) IIMT Unevirsty Meerut.

***Corresponding Author: Iram Jahan**

IIMT College of Medical Sciences (Pharmacy) IIMT Unevirsty Meerut.

Article Received on 17/10/2022 **Article Revised on 07/11/2022** **Article Accepted on 27/11/2022**

ABSTRACT

The cream was prepared using a cream base consisting of beeswax, liquid paraffin, borax, methylparaben, distilled water, rose oil, Aloe Vera gel, dimethylsulfoxide extracts of Cactus and Mint. The cream was prepared using the plate technique/extemporaneous method for geometric and homogeneous mixing of all excipients and herbal extracts. Using the plate technique, we developed three batches of our herbal cream, namely F1, F2 and F3. All three batches were evaluated for various parameters such as appearance, PH, viscosity, phase separation. All three formulations Fl, F2, F3 showed good appearance, pH, adequate viscosity and no phase separation was observed. Also, formulations F1, F2, F3 did not show any redness, erythema and irritation during the irritation study and were easily washable. All three formulations Fl, F2, F3 were stable at room temperature. All three herbal ingredients showed significant different activities. Based on the results, we can suggest that all the three formulations F1, F2, F3 were stable and can be safely used on the skin.

KEYWORDS: Aloe Vera gel, Cactus, Mint, Herbal cosmetic, Multipurpose cream.

INTRODUCTION

Cream is defined as semi-solid emulsions of the oil-in-water (o/w) or water-in-oil (w/o) type, and these semi-solid emulsions are intended for external application. The cream is classified as oil in water and water in oil emulsion. It is applied to the outer or surface part of the skin and its main ability+ is to stay for a longer time at the application site. The task of the skin cream is to protect the skin from various environmental conditions, weather effects and provides a soothing effect to the skin. There are different types of creams like cleansing, cold, foundation, disappearing, night, massage, hand and body cream. The main goal of our work is to develop a herbal cream that can provide a multi-purpose effect such as moisturizing cream, reduce acne and skin irritation, reduce skin diseases such as eczema, psoriasis, dry skin, wrinkles, rashes, etc., and also add shine to the face . . We used three herbal ingredients in our preparation, which are Aloe Vera gel, Cactus, Mint. Aloe Vera gel is used as a moisturizer, to reduce pimples and acne, and is also used to treat burns. Cactus is used as an antifungal and anti-inflammatory agent and is also used to reduce scarring, pigmentation, redness, and itching of the skin. Mint is used for cooling effect.

MATERIALS AND METHODS

Collection of plant material

Aloe Vera, Cactus, Mint leaves were collected from the local botanical garden in Solapur.

Excipients and Herbal ingredients with their roles

Table 1: Role of ingredients.

S. No.	Ingredients	Roles
1.	Aloe Vera gel	Anti-ageing, anti-inflammatory, moisturizer, reduce acne and pimples.
2.	Mint	Cooling effect.
3.	Cactus	Antioxidant, protection skin from free radicals.
4.	Bees wax	Emulsifying agent, stabilizer and gives thickness to the cream.
5.	Liquid paraffin	Lubricating agent
6.	Borax	Alkaline agent which reacts with emulsifying agent to form soap
7.	Methylparaben	Preservative
8.	Rose water	Fragrance

Extraction processes (For different Plant extracts refer fig. 1)

i) Aloe vera gel

Mature, healthy and fresh aloe Vera leaves were collected and washed with distilled water. Then after proper drying of leaves in hot air oven, the outer part of the leaf was dissected longitudinally using a sterile knife. Then the aloe Vera gel that is the colorless parenchymatous tissue was removed using the sterile knife. Then it is filtered using muslin cloth to remove the fibers and impurities. Then the filtrate or the filter product which is a clear aloe Vera gel was used in the preparation.

ii) Extraction of cactus leaves

Cactus leaves were collected and washed with distilled water and dried in hot air oven. After proper drying, leaves were powdered. Then 5g Cactus leaves powder, 80 to 100 degree Celsius. Dimethyl sulfoxide was taken in a volumetric flask and shaken for 3 d on REMI RSB-12 mechanical shaker. Then the solution was heated on a water bath at 80-100 ℃ and concentrated up to 20 ml and then filtered using muslin cloth to remove impurities. Then the filtrate or filter product obtained, which is a clear solution or clear extract of Cactus leaves, was used in the preparation.

iii) Extraction of mint leaves

Mint leaves were collected and washed with distilled water and dried in hot air oven. Then after proper drying, the leaves were powdered. Then 1g mint leaf powder+10 ml dimethyl sulfoxide was taken in a volumetric flask and then shaken for 3 day on REMI RSB-12 mechanical shaker. Then the solution was heated on water bath at 80 to 100 degree Celsius. For few minutes and then concentrated up to 5 ml and filtered using a muslin cloth to remove impurities. Then the filtrate or the filter product in which a clear solution or clear extract of mint leaves was used in the preparation.

Fig. 1: Extracts of natural plant ingredients A) Cactus b) aloe vera c) mint.

Formulation of cream

Heat liquid paraffin and beeswax in a borosilicate glass beaker at 75 ℃ and maintain that heating temperature. (Oil phase). In another beaker, dissolve borax, methylparaben indistilled water and heat this beaker to 75 ℃ to dissolve borax and methylparaben and to get a clear solution. (Aqueous phase). Then slowly add this aqueous phase to heated oily phase. Then add a measured amount of aloe Vera gel, Cactus extract, and mint extract and stir vigorously until it forms a smooth cream. Then add few drops of rose oil as a fragrance. Put this cream on the slab and add few drops of distilled water if necessary and mix the cream in a geometric manner on the slab to give a smooth texture to the cream and to mix all the ingredients properly. This method is called as slab technique or extemporaneous method of preparation of cream. (For formulation table refer table 2) (For different cream formulations refer fig. 2).

Fig. 2: Cream formulations.

Table 2: Formulation of cream.

S. No.	Ingredients	Formulation F_1	Formulation F_2	Formulation F_3
1.	Aloe Vera gel	1. 6ml	1.2 ml	12 ml
2.	Cactus extract	0.6 ml	0.3 ml	0.5 ml
3.	Mint extract	1.6 ml	1.2 ml	1.3 ml
4.	Beeswax	4 g	3.6 g	3.3 g
5.	Liquid paraffin	10 ml	16 ml	13 ml
6.	Borax	0.3 g	0.5 g	0.4 g
7.	Methylparaben	0.03 g	0.05 g	0.04 g
8.	Rose water	Q. S	Q. S	Q. S

Evaluation of cream

Physical evaluation

In this test, the cream was observed for color, odor, texture, state (table 3)

Irritancy

Mark the area (1 cm^2) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported.

Wash ability

A small amount of cream was applied on the hand and it is then washed with tap water.

P^H

0.5 g cream was taken and dispersed in 50 ml distilled water and then P^H was measured by using digital P^H meter

Viscosity

Viscosity of cream was done by using Brooke field viscometer at a temperature of 25 ℃ using spindle No. 63 at 2.5 RPM.

Phase separation

Prepared cream was kept in a closed container at a temperature of 25-100 ℃ away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked.

Spread ability

The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spread ability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

Spread ability= m × l/t

Where,

m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t= time taken in seconds.

Greasiness

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like.

Compatibility study

Compatibility study of the herbal APIs was done by using IR spectroscopy and the IR spectrum was measured in there solid state. The region in which the IR spectrum was measured falls in between 4000.12 to 525.03. The sensitivity was 75. The characteristics peaks which are observed in the IR spectra of the mixture of herbal APIs are 1026.79, 1368.24, 1438.73, 1604.78, 1728.45, 3289.05 cm^{-1}. The same peaks were also observed in the IR spectra of individual herbal APIs.

RESULTS AND DISCUSSION

Evaluation results of all the 3 formulations are gives below.

Physical evaluation

In this test color, odor, texture and state of the three formulations were checked.

Irritancy

Mark the area (1 cm^2) on left hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported. According to the results all the three formulations that is F1H, F2H and F3H showed no sign of irritancy, erythema and edema.

Table 3: In this test Color, Odor, Texture and State of the three formulations was checked.

S. No.	Parameters	Formulation F_1	Formulation F_2	Formulation F_3
1.	Color	Green	Faint green	Faint green
2.	Odor	Pleasant	Pleasant	Pleasant
3.	Texture	Smooth	Smooth	Smooth
4.	State	Semisolid	Semisolid	Semisolid

Table 4: Irritancy study observations.

S. No.	Formulation	Irritant effect	Erythema	Edema
1.	F1	Nil	Nil	Nil
2.	F2	Nil	Nil	Nil
3.	F3	Nil	Nil	Nil

Washability

Washability test was carried out by applying a small amount of cream on the hand and then washing it with tap water. All three formulations were easily washable.

pH

According to the results, the P^H of all the three formulations that is F1H, F2H and F3H were found to be nearer to skin P^H so it can be safely used on the skin.

Table 5: Wash ability observations.

S. No.	Formulation	Washability
1.	F1	Easily Washable
2.	F2	Easily Washable
3.	F3	Easily Washable

Table 6: pH observation table.

S. No.	Formulation	pH
1.	F1	6.6
2.	F2	6.1
3.	F3	6.5

Viscosity

Viscosity of cream was done by using Brooke field viscometer at a temperature of 25 ℃ using spindle No. 63 at 2.5 RPM. According to the results all the three formulations showed adequate viscosity.

Phase separation

Prepared cream was kept in a closed container at a temperature of 25-100 ℃ away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked. According to the results no phase separation was observed in all the three formulations.

Spread ability

The spread ability of the three formulations that is F1H, F2H, and F3H was carried out and out of that for F2H the time taken by the 2 slides to separate is less so as said in the description of evaluation test lesser the time taken for separation of the two slides better the spread ability so according to this statement F2H showed better spread ability.

Greasiness

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like. According to the results, we can say that all three formulations were non-greasy.

Compatibility study

From fig. 4, 5, 6 we can say that herbal ingredients that is Aloe Vera gel, Cactus, mint are compatible with each other and active ingredients in them showed proper peaks in the IR graphs and all the three herbal ingredients showed matching peaks in there IR graphs. The peaks of mint were shown in table 11, peaks of Cactus were shown in table no. 12 and peaks of the mint + Cactus + Aloe Vera gel mixture.

Table 7: Viscosity observation table.

S. No.	Formulation	Viscosity(Cps)
1.	F1	21021
2.	F2	11812
3.	F3	18822

Table 8: Phase separation observation table.

S. No.	Formulation	Phase separation
1.	F1	No phase separation
2.	F2	No phase separation
3.	F3	No phase separation

Table 9: Spread ability observation table.

S. No.	Formulation	Time(sec)	Spread ability (g×cm/sec)
1.	F1	12	23.9
2.	F2	6	33.5
3.	F3	17	16.19

Table 10: Greasiness observation table.

S. No.	Formulation	Greasiness
1.	F1	Non-greasy
2.	F2	Non-greasy
3.	F3	Non-greasy

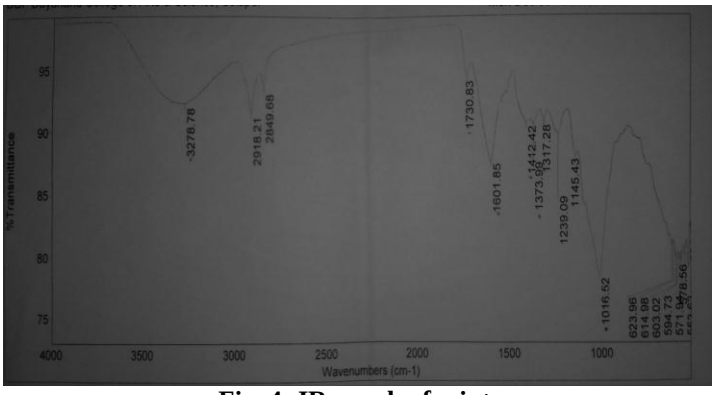

Fig. 4: IR graph of mint.

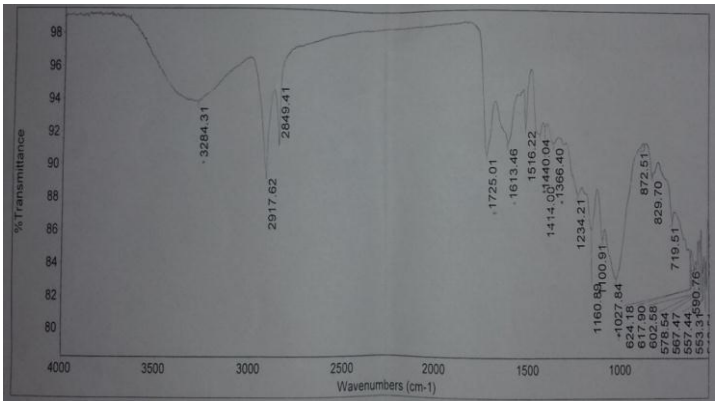

Fig. 5: IR graph of Cactus.

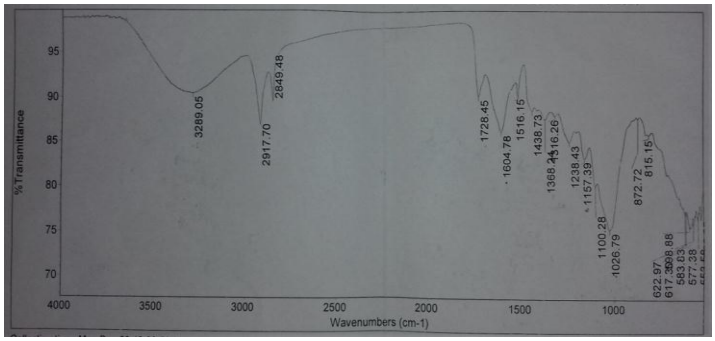

Fig. 6: IR graph of mint+ Cactus +Aloe Vera gel mixture.

Table 11: Interaction studies through IR spectroscopy (Refer fig. 4).

Material	Peaks (Cm^{-1})	Characteristic functional group
Mint	1017.53	C-O stretching vibration
	1374.98	Sulfate stretching vibration
	1413.45	C-O-H Bending vibration
	1602.87	C=O stretching vibration
	1731.89	C=O stretching vibration
	3279.72	N-H Bending vibration

Table 12: Interaction studies through IR spectroscopy (Refer fig. 5).

Material	Peaks (cm^{-1})	Characteristic functional group
Cactus	1028.86	C-O stretching vibration
	1367.45	Sulfate stretching vibration
	1441.06	C-O-H bending vibration
	1614.47	C=O Stretching vibration
	1726.03	C=O Stretching vibration
	3287.35	N-H Bending vibration

Table 13: Interaction studies through IR spectroscopy (Refer fig. 6).

Materials	Peaks	Characteristic function group
Mint + Cactus + Aloe Vera gel mixture	1027.80	C-O stretching vibration
	1369.25	Sulfate stretching vibration
	1437.74	C-O-H Bending vibration
	1605.79	C=O stretching vibration
	1729.46	C=O stretching vibration
	3289.06	N-H Bending vibration

CONCLUSION

By using Aloe Vera gel, Cactus and mint the cream showed a multipurpose effect and all these herbal ingredients showed significant different activities. Based on results and discussion, the formulations F1H, F2H and F3H were stable at room temperature and can be safely used on the skin.

REFERENCES

1. A. Nitave. Formulation and evaluation of polyherbal cosmetic cream. World J Pharm Pharm Sci, 2016; 5: 777-10.
2. T. AC Dweck. Aloe vera leaf gel: a review update. J Ethno Pharmacol, 2000; 89: 3-37.
3. Sharma P., MZ Abdin, Ajit Varma. A review on the pharmacological properties of Aloe Vera. Int J Pharm Sci Rev Res, 2016; 87: 38-7.
4. S. Pankaj,. Review on neem (Azadirachta indica): thousand problems one solution. Int Res J Pharm, 2013; 2: 91-101.
5. K.P. Kumar, Traditional Indian herbal plants Tulsi and its medical importance: a review. Res Rev: J Pharmacogn Phytochem, 2015; 2: 72-8.
6. T. Johnson, Nancy Beaulah S, Laju RS, Anupriya G, Renola Joy Jeba Ethal T. Anti-bacterial and anti-fungal activity of aloe Vera gel extract. Int J Biomed Adv Res, 2011; 3: 187-195.
7. K. Chhotalal. Importance of trituration technique on preparation and evaluation of cold cream. Inventi Rapid Pharm Tech, 2015; 1-2: 2013.