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Research on Formulation and Evaluation of Multipurpose Herbal Cream

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A B S T R A C T

Herbal cosmetics are items utilized to enhance one's appearance. The objective of the study was to create a herbal cream for moisturizing, nourishing, brightening, and addressing various skin ailments. The cream was formulated using key ingredients such as Curcuma longa (Turmeric), genus tagetes (Marigold), Aloe barbadensis (Aloe vera), Azadirachta indica (Neem). The choice of ingredients relies on the distinct therapeutic qualities of the agents. Different assessment criteria are applied to the cream. According to the results and discussion, the formulations remained stable at room temperature and can be safely applied to the skin. This cream formulation is an o/w type emulsion, which allows for easy washing off with plain water after use. The formulation demonstrated good spreadability. The viscosity and pH of the cream were also satisfactory. There was no indication of phase separation in the cream during storage. The cream has a non-greasy texture and can be easily removed after application. The formulation is non-irritating and poses no harm to the skin. The cream was prepared using the slab method and was further assessed through various evaluation parameters, including physical properties, pH, spreadability, washability, non-irritancy tests, viscosity, and phase separation of the cream, all of which yielded positive results.

Keywords: Cosmetic, Herbal cream, Turmeric, Marigold, Aloe-vera, Neem.

INTRODUCTION

Creams are semisolid emulsions of the water in oil (w/o) or oil in water (o/w) types that are designed to be applied externally. Cream is categorised as an emulsion of water and oil. Its primary function is to stay at the application site for an extended amount of time. It is applied to the outside or superficial portion of the skin. A skin cream's dual purpose is to soothe the skin and protect it from various environmental factors and weather conditions. Creams come in several varieties, including cleansing, cold, foundation, disappearing, night, massage, hand, and body creams. Our primary goal is to create a multifunctional herbal cream that hydrates, reduces acne and skin irritation, and lessens skin conditions including psoriasis, eczema, dry skin, wrinkles, rashes, and more. And also adding glow to the face. In our formulation, we employed three natural ingredients: neem, and aloe vera gel. Aloe Vera gel is used as a moisturiser, to cure burn wounds, and to lessen acne and pimples. Neem is used to lessen skin scarring, pigmentation, redness, and itching. It also has antifungal and anti-inflammatory properties. Tulsi is used to encourage wound healing and give skin a radiant appearance. Over exposure to ultraviolet light has been known to cause sunburn cells, rapid ageing of the skin, and an increased risk of skin cancer.

Many new and traditional herbal cosmetics can help heal damaged skin. More efficient sun protection is needed because of the steadily rising frequency of melanoma, non-melanoma cutaneous neoplasia, and paraneoplastic diseases. Despite the fact that sunscreens with UV filters are quite effective at shielding the

skin from the sun's harmful rays, herbal sunscreens are quickly taking their place because of the negative consequences that come with UV filters. Our primary goal is to create a multifunctional herbal cream that can moisturise, lessen skin irritation and acne, and treat dry skin, wrinkles, rashes, and other issues. Cosmetics are items that are applied to the body.

Fig 1. Aloe vera leaf

Fig 2. Marigold Flower

Fig 3. Turmeric

Fig 4. Neem leaf

Benefits of Aloe vera gel -

1. Aloe-vera is rich in moisturising properties that help to remove dead cells.
2. Prevent or reduce wrinkles and dark spots on your face.
3. Moisturize dry skin.
4. Soothe irritated skin.
5. Remove signs of ageing.
6. Its anti-inflammatory properties can also reduce pain, swelling, and soreness of wounds or injuries.
7. It has a cooling effect on rashes or sunburns.
8. It supports the production and release of collagen.
9. Combats blemishes and pimples.
10. Reduces puffiness and dark circles.
11. Eases psoriasis and eczema.
12. Gets rid of dead skin cells.
13. Treats sunburns.
14. Give the skin a natural glow.
15. Skin was hydrated using vital.
16. Reduces stretch marks and delays the onset of premature ageing.

Benefits of Marigold -

1. Beauty Secrets.
2. Facilated Sleep.
3. Proven Result.
4. Improve Digestion.
5. Releves From Nausea.
6. Heals wounds and chapped skin.
7. Contains cell regenerative properties.
8. Great for dry and damaged skin.
9. Calms acneic skin.

10. Soothes rashes & soreness.

Benefits of Turmeric -

1. Natural anti-inflammatory compound.
2. Boosts heart health and prevents cancer and Alzheimer's disease.
3. Powerful antioxidant.
4. Treats depression.
5. Cures acne.
6. Reduces dark circles.
7. May help psoriasis and eczema.
8. Cleanses the skin.
9. Aids in wound healing. aids in weight loss.
10. Shields the body from free radicals.
11. Acts as an antimicrobial agent.

Benefits of Neem -

1. It can be used on both the face and the hair.
2. It protects against dandruff.
3. It smoothes and shines the dry scalp.
4. It increases brightness and has an anti-aging impact.
5. It increases blood circulation.
6. Neem is rich in antioxidants and vitamin E, which reduce wrinkles.
7. It also helps treat ulcers.
8. It keeps the skin healthy and radiant.
9. It has antibacterial properties that help get rid of pimples.
10. It lightens and blurs the scars left by acne; it is anti-inflammatory in nature with fatty acids and glycosides.
11. It soothes eczema.
12. It prevents infections.
13. It evens out skin tone.
14. It has anti-aging benefits.

Benefits of Rose oil –

1.Brightening and Toning

2. Acne management

3. Soothing & anti inflammatory

4.Potential Anti-aging Effects

5. Skin Renewal

MATERIALS AND METHODS

Collection of plant Materials - Neem, aloe vera, marigold, and turmeric were gathered from the nearby botanical garden. There is no denying that drugs that contain the highest concentration of active components are collected appropriately, regardless of the type of crude drug and the collection region. The benefits of

the current environment are also taken into account while gathering crude medications, and when gathering natural drugs on a commercial basis, careful consideration should be given to the utilisation of expert workers. Depending on which section of the fruit is used, the fruits are picked. They gathered fully developed apples that were either ripe or half-ripe. When they have the highest concentration of chemical constituents and a sufficient supply of reserve food material, rhizomes are harvested. For scientific purposes, herbaria are collections of preserved plant samples and the data that goes with them.

METHODS OF PREPARATION

Slab method - Until a consistent preparation is achieved, the ingredients are combined. An ointment mill will be used in one small-scale process, such as spontaneous compounding. Use a hard rubber spatula if an ointment's ingredients react with metal. To give the cream a smooth texture and ensure that all the components are properly mixed, place the cream on the slab, add a few drops of distilled water if needed, and mix the cream in a geometric pattern. This process is known as the slab technique or the extemporaneous method of cream preparation.

Fig. 5. Ointment Slab

Trituration method - Apply the trituration process to liquids or finely separated insoluble powder particles. A geometric dilution is used to add insoluble powder. To prevent the creation of air pockets, liquid is introduced by constructing a well in the middle. Using a stainless-steel spatula, reduce the solid medication to a fine powder and combine it with a little amount of base on an ointment slab until a homogenous product is generated. (Figure 5).

Fusion method - Fusion is the process of applying heat to cause liquefaction or melting. The fusion process involves combining, melting, and cooling all or some of the ingredients of an ointment while stirring constantly until they solidify. Melting the base of an ointment lowers its melting point. Melting the highest melting point should come first, followed by the lowest melting point. In order to prevent overheating of low-melting-point substances, add the medication gradually to the melted mass and mix well until the mass cools and uniform products develop.

Herbal ingredients & Excipients with their roles

Table 1. Excipients and herbal ingredients used with their roles

Sr.no.	Ingredients	Roles
1.	Marigold	Anti-inflammatory, antioxidant, Wound healing.
2.	Aloe vera	Anti-ageing, reduce acne and

		pimples.
3.	Turmeric	Glow your skin and antiseptic, anti-inflammatory.
4.	Neem	Relieves skin dryness promote wound g Healing.
5.	Borax	Alkaline agent.
6.	Bees wax	Emulsifying agent
7.	Liquid paraffin	Lubricating agent.
8.	Methyl paraben	As a preservative
9.	Distilled water	Vehicle.
10.	Rose oil	Fragrance.

Extraction Process

1) Aloe vera - Aloe Vera leaves that were fresh, mature, and in good health were gathered and cleaned with distilled water. The outer portion of the leaf was then longitudinally dissected with a sterile knife following the appropriate drying of the leaves in a hot air oven. The sterile knife was then used to cut away the colourless parenchymatous tissue, which is aloe vera gel. The fibres and contaminants are then eliminated by filtering it through muslin cloth. The preparation was then done using the filtrate, or filter product, which is a transparent aloe vera gel. Vitamin E. oil is used in Aloe vera gel to increase the shelf life.

2) Marigold - Hand picking method was used to gather the marigolds, and the cleaned petals were separated. The aforementioned petals were dried at 80–100 degrees Celsius in a hot air oven. A beaker was filled with dried marigold. About 300 millilitres of each solvent ethanol and petroleum ether are taken and put into a round-bottom flask. The soxhlet device is loaded with dried marigold. The top is connected to the condenser, while the bottom is installed in RBF. The temperature of the RBF, which is connected to a heating module, was set at 65 degrees Celsius. Continue extracting until you have a thick, viscous, yellow-brownish extract. [12].

3) Turmeric - Consider the meaty turmeric rhizomes. For three hours, the turmeric rhizomes were dried in an oven set to 105 °C. The dried rhizome was ground into a consistent powder. To avoid moisture absorption, the turmeric powder was kept refrigerated. A thimble containing 10 g of weighed turmeric powder was placed inside the Soxhlet device, which was progressively filled with acetone as the extraction solvent. Within eight hours, the extraction was completed at 60 °C. Following extraction, a rotary evaporator operating under vacuum at 35°C was used to separate the acetone from the extract.

4) Neem - After being gathered, neem leaves were cleaned with distilled water and dried in a hot air oven. When the leaves were properly dried, they turned to powder. Next, 5 grammes of powdered neem leaves and 80–100 millilitres of dimethyl sulfoxide were placed in a volumetric flask and shaken. To get rid of contaminants, the solution is then heated to 80–100 degrees Celsius in a water bath and concentrated to 20 millilitres. After that, a clear solution extract of neem leaves was the filtrate or filter product

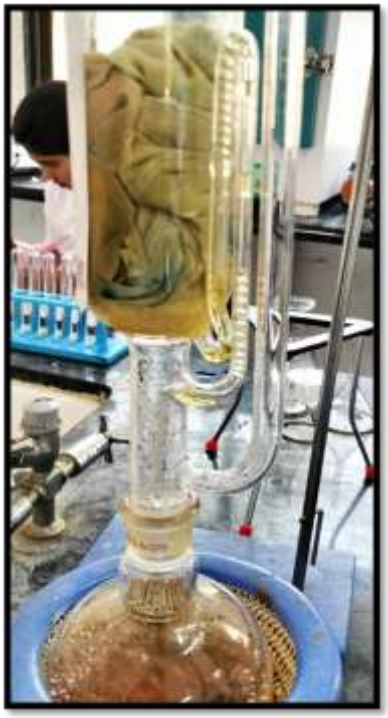

Fig 6. Extraction 1

Fig 7. Extraction 2

Fig 8. Neem extract

Fig 9. Rose oil

Fig 10. Herbal extracts of Marigold, Turmeric, Aloe vera & Neem

Formulation

Table 2. Formulation table

Sr. no.	Ingredients	F1C	F2C	F3C
1.	Marigold Extract	2.7ml	1.6ml	1.4ml
2.	Aloe vera Extract	2.8ml	1.4ml	1.6ml
3.	Turmeric Extract	1.7ml	1.0 ml	1.0 ml
4.	Neem Extract	0.5ml	0.5ml	0.5ml
5.	Borax	0.3 gm	0.5 gm	0.2 gm
6.	Bees wax	7.0 gm	7.0 gm	7.0 gm
7.	Liquid paraffin	18.1ml	20.3ml	20.1ml
8.	Methyl paraben	0.3gm	0.5gm	0.5gm
9.	Distilled water	q.s	q.s	q.s
10.	Rose oil	q s	q.s	q s

Formulation of Cream

Maintain the heating temperatures (oil phase) at 75°C while the liquid paraffin and beeswax are in a borosilicate glass breaker. Borax and methyl paraben should be dissolved in distilled water in a different beaker that is kept at 75°C with a water bath. Using a glass rod, stir the mixture until all of the solids have dissolved (aqueous phase). While continuing to stir, gradually add the heated aqueous phase to the heated oily phase. Once all stages have been mixed, add the aloe-vera gel extract, marigold extract, neem extract and turmeric extracts. Then, add the rose oil and continue mixing with a glass rod until a creamy cream forms.

Evaluation of Multipurpose Herbal Cream

1) Physical parameters: The cream's colour, texture, odour, and condition are all assessed in this test.

2) Irritancy Test: Mark the 1 cm^2 region on the dorsal surface of the left hand. After applying the lotion to the affected region, the time was recorded. The irritating impact, erythema, and oedema, if any, are examined after a 24-hour interval.

Table 3. Irritancy test

Sr.no.	Formulation	Irritant effect

1.	F1C	Nil
2.	F2C	Nil
3.	F3C	Nil

3) Washability Test: To evaluate washability, a tiny amount of cream was applied to the hand, and it was then washed with tap water. all three formulations were readily washable (Table 4).

Table 4. Washability Test

Sr.no.	Formulation	Washability
1.	F1C	Washable
2.	F2C	Washable
3.	F3C	Washable

4) Phase separation: The prepared cream is stored at room temperature, out of direct sunlight, in a tightly sealed container, and it is monitored for 24 hours to determine its phase. (Table 5)

Table 5. Phase Separation

Sr. no.	Formulation	Phase Separation
1.	F1C	No
2.	F2C	Yes
3.	F3C	Yes

5) Determination of pH: Mix 5 grams of cream with 50 ml of distilled water. The pH can then be measured with a digital pH meter. (Table 6)

Table 6. pH test

Sr.no.	Formulation	pH
1.	F1C	6.58
2.	F2C	6.47

3.	F3C	6.66

6) Spreadability Test: The F1C, F2C, and F3C formulations are tested for spreadability. The better the spreadability, the shorter the time it takes to separate the two slides. Accordingly, F1C demonstrated superior spreadability. (Table 7)

Table 7. Spreadability test

Sr.no.	Formulation	Spreadability
1.	F1C	5.8
2.	F2C	5.1
3.	F3c	6.2

7) Consistency – Consistency was estimated by visual detection.

8) Determination of Homogeneity: The formulations were tested for the homogeneity by visual appearance and by touch. The cream is uniformly distributed on skin.

The present research was the Formulation and Evaluation of Multipurpose Herbal Cream. The evaluation parameter was coming under the result like the Physical Evaluation, pH determination, Spreadability, Washability, Irritancy Test, Stability test, Homogenecity determination of the Multipurpose Herbal Cream is shown below in Table 8.

Table 8. Evaluation parameters of Multipurpose Herbal cream

Sr. No.	Tests	F1C	F2C	F3C
1.	Colour	Faint Yellow	Faint Yellow	Faint Yellow
2.	Odour	Pleasant	Pleasant	Pleasant
3.	Consistency	Smooth	Smooth	Smooth
4.	State	Semi-solid	Semi-solid	Semi-solid
5.	Appearance	Good	Good	Good
6.	pH	6.58	6.47	6.66
7.	Homogeneity	Homogenous	Non- Homogenous	Non- Homogenous
8.	Spreadability	5.8	5.1	6.2
9.	Irritancy	No	No	No
10.	Washability	Washable	Washable	Washable

11.	Phase Separation	No	Yes	Yes

CONCLUSION

The cream had a multifunctional effect by using turmeric, Marigold, aloe vera, neem, and each of the herbal constituents used demonstrated distinct and noteworthy activities. Based on the findings, we can conclude that all three formulations - F1C, F2C and F3C were safe to apply to the skin and stable at room temperature. Thus, the F1C formulation of herbal cream is superior than the F2C and F3C formulations, according to the statement. This study focusses on the potential of plant extracts for cosmetic applications. The personal care system now uses cosmetics for many more purposes.

Cosmetic products that contain bioactive ingredients affect the biological processes of the skin and supply the nutrients required for healthy skin. The produced formulation demonstrated high consistency throughout the trial period, good spreadability, and no signs of phase separation in F1C formulation. Using fewer chemicals, the created herbal cream has the highest qualities and nutritional values, protecting the skin from a variety of skin issues. Because it was made using basic materials and a straightforward process, the cream is also cost-effective. The herbal cosmetic composition is safe to use and can be applied as a skin-protective barrier. The formulation might be applied topically to shield skin from harm, according to the results of various cream testing. Because they are thought to be safer and have fewer adverse effects than synthetic ones, natural therapies are more widely accepted.

CONFLICT OF INTEREST

Authors declare for none conflict of interest.

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