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Research Article

Formulation And Evaluation of Multipurpose Herbal Cream

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ABSTRACT

Herbal cosmetics are products used to enhance an individual's appearance. The purpose of this study was to prepare an herbal cream for the purpose of moisturizing, nourishing and treating various skin diseases. Various crude drugs such as *Aloe barbadensis* (Aloe Vera leaves), *Azadirachta indica* (Neem leaves) and *Emblica officinali* (Tulsi) are used to make the cream. The choice of ingredients is based on the various medicinal properties of these agents. The cream is tested on different evaluation parameters.

INTRODUCTION

Creams are semi-solid formulations containing one or more agents dissolved or dispersed in a water-in-oil emulsion or oil-in-water emulsion or another washable base. Creams can be divided into oil-in-water and water-in-oil emulsions. It is used on the face or outside of the skin and has the advantage of staying for a long time where it is applied. The main function of the skin cream is to protect against different environmental factors, weather conditions and provide a soothing effect on the skin. The general types of creams are cold, cleansing, vanishing, foundation, massage and body creams[1].

Herbal cosmetics are defined as cosmetic products with physical needs such as healing, brightening, strengthening and healing effects, as there are plant species. Cosmetics are products used to cleanse, beautify, increase attractiveness and change the human body without affecting the body's structure or function. The basic philosophy of cosmetics is deeply rooted in Rigveda, Yajurveda, Ayurveda, Unani and homeopathic medicine systems. Herbal products used in raw or extract form. The herbs have antiseptic, antibacterial, antiseptic, antibacterial, emollient, anti-seborrheic, anti-keratolytic activity and

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antibacterial etc. It should have many features. Herbal medicine that protects the skin without toxic or toxic residue or any irritation when used regularly, even if used beautifully[2].

ADVANTAGES OF HERBAL CREAM

- They do not provoke allergic reaction and do not have negative side effects.
- They are easily incorporated with skin.
- When small quantity they are very effective as compared to synthetic cosmetic.
- Extract of plant decreases the bulk property of cosmetics and gives appropriate pharmacological effects.
- Easily available and found in large variety and quality.
- Easy to manufactures and cheap cost.

DISADVANTAGES OF HERBAL CREAM

- Herbal drugs have slower effects as compare to Allopathic dosage form. Also, it requires long term therapy.
- They are difficult to hide taste and odour.
- Most of the herbal drugs are not easily available.
- Manufacturing process is time consuming and complicated.
- No pharmacopoeia defines any specific procedure or ingredients to be used in any of herbal cosmetics[3].

BENEFITS OF HERBAL CREAM

- Treats pimples and acne.
- Controls excess oil secretion.
- Makes the skin softer and smoother.
- Maintains pH balance of the skin.
- Suitable for all skin types.
- 100% cruelty-free.
- Easily available
- Economical
- It enhances the energy level of the body.
- Variety of phyto-constituents can be incorporated[4, 5].

IDEAL PROPERTIES OF HERBAL CREAM

- It should liquefy at body temperature.
- It should not normally be diluted.
- Should give a cooling effect on the skin after external application.
- Less greasy than ointment and easily spread on the skin.
- The pH of the cold cream must be optimum from 4.6-6.0.
- It should penetrate the epidermis (via natural process).
- Its viscosity should be low enough to permit easy spreading.
- It should be non-toxic.
- The excipients should be compatible with each other. It should be sterile.
- It should be non – irritant.
- It should be non – inflammatory.

DRUG SELECTION CRITERIA FOR HERBAL CREAM

1. Gel should not have too much dry gel; it should not have skin irritancy.
2. Ability to cross skin layer and cure skin problems permanent.
3. It should have a pleasant smell.
4. It should suitable for all type skin such as dry skin.
5. It should suitable be available in affordable price.
6. It should be natural origin.
7. Ability to provide more moisture[6].

TYPES OF BASES USED IN HERBAL CREAMS

1. **Oleaginous bases**: - It is consisting of oil and fat. It is anhydrous non- washable and do not absorb water.
    - Petroleum (soft paraffin): - Semi solid hydrocarbon + lubricating oil

i. Yellow soft paraffin: - obtained from petroleum also may contain anti-oxidant like vitamin E and BHT. Melting range: - 38 to 56°c

ii. White soft paraffin: - obtained from petroleum. Melting range: - 38 to 56°c
iii. Hard paraffin: - mixture of solid hydrocarbon obtained from petroleum. Solidifies: - 50 to 57°C
iv. Liquid paraffin: - It is a mixture of liquid, hydrocarbon obtained from petroleum.

2. **Absorption bases: -**
   - Composition base + w/o surfactant
   - Water content: - anhydrous
   - Solubility in Water: - insoluble
   - Spread ability: - difficult
   - Wash ability: - non washable
   - Stability: - oil poor, hydrocarbon better
   - Drug incorporation: - solid oil and aqueous solution
   - Drug Release: - Poor but greater than oleaginous
   - Example: - wool fat (anhydrous lanolin) absorbed 50% of water its own weight.
   - Hydrous wool fat (lanolin): - 70% W/W wool fat + 30 % W/W purified water.
   - It is a w/o emulsion.
3. **Water miscible bases**: -
   - They are miscible with an excess of water ointment made from water miscible bases are easily remove after use.
   - There are three official anhydrous Water miscible ointment base.
   - Example: - Emulsifying ointment B.P.: - anionic emulsifier, ceterimide Emulsifying ointment B.P.: cationic emulsifier. Cetomacrogel Emulsifying ointment B.P. - Non- ionic emulsifier.
   - It is used for O/W creams.
   - Compound benzoic acid ointment used as anti-fungal ointment.
4. **Water soluble bases: -**
   - Water soluble bases contain only the water-soluble ingredients and not the fats or other greasy substance hence, they are known as grease less bases.
   - Water soluble bases consists of water-soluble ingredients such as polyethylene glycol polymer (PEG) which are popularly known as carbowaxes and commercial known as macrogols.
   - Example: - Macrogol 200, 300, 400: - viscous liquid
   - Macrogol 1500: - greasy semi solid
   - Macrogol 1540, 3000, 4000: - waxy solids[7]

ANATOMY OF SKIN

The skin is the body's largest organ, covering all of the body's systems. It consists of three layers: epidermis, dermis and subcutaneous tissue, all three layers have very different structures and functions. The structure of the skin has an intricate network and is the body's first line of defense against viruses, UV rays, drugs and all kinds of damage. It also controls the temperature and water released into the environment.

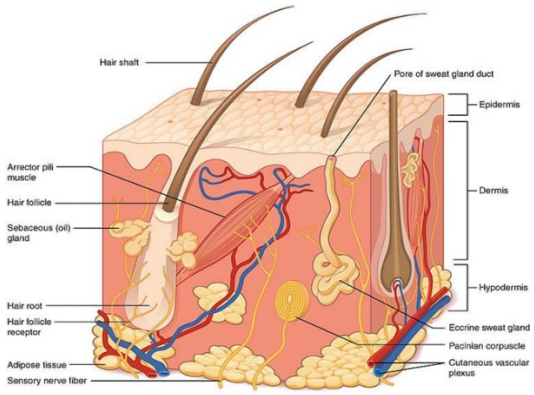

Figure 1: Anatomy of Skin

The epidermis

The epidermis is the outer layer of the skin that protects the skin from external factors. The thickness of the epidermis depends on the skin type. Its thickness is only 0.05 mm on the eyelids and 1.5 mm on the palms and feet. The epidermis contains melanocytes (cells that produce melanoma), Langerhans cells (involved in the skin's immune system), Merkel cells, and nerve cells. The epidermis itself is made up of five sub-

layers that work together to continually renew the skin's surface.

Dermis

The dermis is attached to the epidermis at the basement membrane level and has two layers of tissue, the papillary and reticular layers, which are fused together without a clear boundary. The papillary layer is the thin upper layer of loose connective tissue in contact with the epidermis. The reticular layer is a deeper, thicker, less cellular layer and contains dense connective tissue/collagen fibers. The dermis contains sweat glands, hair, roots, muscles, neurons, and blood vessels.

Hypodermis

The subcutaneous tissue is located deep in the dermis and is also known as the subcutaneous fascia. It is the deepest part of the skin and contains fat lobules as well as some skin appendages such as hair follicles, sensory neurons, and blood vessels[8].

HERBS USED IN PREPARATION OF MULTIPURPOSE HERBAL CREAM

Aloe Vera

Family: Asphodelaceae

Biological source: Dried latex of leaves of aloe vera

Biological name: *Aloe barbadensis miller*

Therapeutic uses: A number of beneficial effects of aloe vera including immunomodulatory, wound and burn healing, hypoglycemic, anticancer, gastro-protective, antifungal, and anti-inflammatory property.

Medicinal uses

These polyphenols, along with some of the other compounds in aloe vera, help prevent the growth of certain bacteria that can cause disease in humans. Aloe Vera is known for its antibacterial, antifungal and antiviral properties. This is one reason why it helps to heal wounds and cure skin problems. Aloe Vera is often referred to as a cosmetic used to treat sunburn. Additionally, it may provide other health benefits, mainly due to its antioxidant properties. Preliminary research suggests that aloe vera may benefit your skin, teeth, mouth and digestive health.

Figure 2: Aloe vera

Neem

Family: -Meliaceae.

Biological source: Fresh or dried leaves and seed oil of *Azadirachta indica*.

Biological name: *Azadirachta indica*

Therapeutic uses: Immunomodulatory, anti-inflammatory, anti-hyperglycemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic and anticarcinogenic.

Medicinal uses

Neem leaves are used for leprosy, eye disease, nosebleeds, intestinal worms, stomach upset, and loss of appetite, skin ulcers, heart and blood vessel diseases (cardiovascular disease), fever, diabetes, gum disease (gingivitis) and liver disease. The leaves are also used to control birth and cause miscarriage.

Figure 3: Neem leaves

Tulsi

Family: -Lamiaceae

Biological name: *Ocimum sanctum linn*

Biological source: -fresh and dried leaves of Ocimum species like *Ocimum sanctum L*. and *Ocimum basilicum L*. etc.

Medicinal uses

Holy basil contains vitamin C and antioxidants such as eugenol, which protects the heart from the harmful effects of free radicals. Eugenol also proves useful in reducing cholesterol levels in the blood. Tulsi acts a mild diuretic & detoxifying agent which helps in lowering the uric acid levels in the body. Acetic acid present in holy basil helps in the breakdown of the stones. Tulsi is a natural headache reliever which can also relieve migraine pain. Tulsi's anti-inflammatory properties help promote eye health by preventing viral, bacterial and fungal infections. It also soothes eye inflammation and reduces stress.

Figure 4: Tulsi Leaves

AIM AND OBJECTIVE

Aim

To formulate and evaluate multipurpose herbal cream.

Objective

1. To evaluate safety, efficacy and quality of multipurpose herbal cream.
2. To explore the many aspects of the rich traditional Indian herbal medicine.
3. To apply knowledge gained during the course in evaluating the usefulness of herbal formula.
4. To formulate and evaluate a cosmetic herbal cream for glowing skin by using natural ingredients.
5. To synthesize a cold cream ideal for all skin types.
6. To find the useful benefits of herbal cream on human use as cosmetic product.

MATERIALS AND METHODS

Herbs Required

Sl.no	List of herbs used	Botanical Name	Action
1.	Aloe-Vera extract	*Aloe barbadensis miller*	Anti-ageing, reduce acne and pimples
2.	Neem extract	*Azadirachta indica*	Relieves skin dryness promote wound healing
3.	Tulsi extract	*Ocimum sanctum linn*	Antibacterial, add glow to the face

Table 1: List of herbs used and their roles

Chemicals Required

Sl.no	List of Chemicals used	Action
1.	Bees wax	Emulsifying agent, stabilizer
2.	Liquid paraffin	Lubricating agent
3.	Borax	Alkaline agent
4.	Distilled water	Vehicle
5.	Rose oil	Fragrance
6.	Methyl Paraben	Preservatives

Table 2: List of Chemicals Used and their roles

Extraction Process

Preparation of Aloe vera extract: Ripe and fresh aloe vera leaves were collected from the plant and washed with distilled water. is a drying hot air oven. Cut the leaves lengthwise with a sterile knife. Gather semi-solid aloe vera. Remove fibers and impurities from it. Collect the Liquid aloe vera extract.

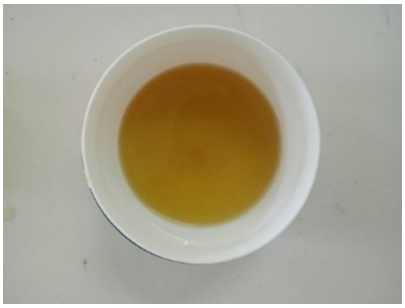

Figure 5: Aloe vera extract

Preparation of neem extract: Collect fresh neem leaves and wash them with distilled water. Dry in a hot air oven, then crush, take 5 grams of neem powder in 20 ml of dimethyl sulfoxide and heat at 100°C for 5 to 10 minutes. It is then filtered through filter paper to obtain a pure solution.

Figure 6: Neem extract

Preparation of tulsi extract: Collect the tulsi leaves, wash them with distilled water and dry them in a hot air oven. Then, after proper drying, the leaves are pulverized. Then put 1 g of tulsi leaf powder and 10 ml of DMSO in the container. The solution was heated in a water bath at 80°C to 100°C for 5 to 10 minutes, then filtered through filter paper and the tulsi leaf extract was obtained[9].

Figure 7: Tulsi extract

Formulation of Cream

- Take the liquid paraffin and bees wax in a borosilicate glass breaker and heat at 75°C and maintain that heating temperatures (oil phase).
- In other beaker, dissolve borax and distilled water by maintaining temperatures 75°C with water bath.
- Stir the solution with glass rod until all solid particles get dissolve (Aqueous phase). Then gently add heated aqueous phase in heated oily phase with continue stirring.
- After mixing both phases, immediately add aloe-vera extract, neem extract and tulsi extract into it with continuous mixing using glass rod until it forms a smooth cream. When cream is formed, then add rose oil as fragrance[10, 11].

Sl. No	Ingredients	Formulation code		
		F1HC	F2HC	F3HC
1	Neem extract	2.7 ml	1.42 ml	1.67 ml
2	Aloe-vera extract	0.9 ml	0.28 ml	0.67 ml
3	Tulsi extract	2.7 ml	1.42 ml	1.67 ml
4	Beeswax	5.45 g	4.97 g	5.36 g
5	Liquid paraffin	18.1 ml	21.32 ml	20.11 ml
6	Borax	0.36 g	0.56 g	0.50 g
7	Methyl Paraben	0.03 g	0.056 g	0.050 g
8	Distilled Water	q. s	q. s	q. s
9	Rose Water	q. s	q. s	q. s

Table 3: Formulation Table

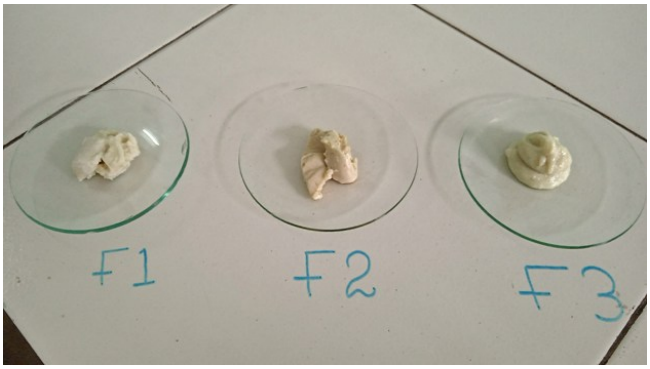

Figure 8: Formulations

EVALUATION METHODS OF MULTIPURPOSE HERBAL CREAM

Morphological Evaluation

- **Physical properties:** The cream was observed for the colour, odour and appearance[12].

Physicochemical Evaluation

- **Washability:** The ease of removal of the cream applied was examined by washing the applied part with tap water and the ease with which the washing of the cream was observed[13].
- **pH of the Cream:** The pH meter should be calibrated using standard buffer solution. About 0.5 g of the cream was taken and dissolved in 50.0 ml of distilled water then pH was measured using pH meter[14].
- **Spreadability:** Cream was placed between two glass slides and compressed to uniform thickness by placing 100 g of weight for 5 min. A weight was added to the pan. The time required to separate two slides i.e., time in which upper glass slide moved over lower slide was taken as a measure of spreadability[15].

$$S = m * l / t$$

m = weight on upper slide
l = length moved on a glass slide
t = time taken

- **Irritancy test:** An area (1sq.cm) on the left-hand dorsal surface was used for this purpose. 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 hr[16, 17].
- **Dye test:** The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide then covers it with a cover slip, and examines it under a microscope. If the disperse globules appear red the ground colourless. The cream is o/w type. The reverse condition occurs in w/o type cream i.e., the disperse globules appear colourless[18].
- **Phase separation:** The prepared cream was transferred in a suitable wide mouth container. Set aside for storage the oil phase and aqueous phase separation were visualizing after 24 hours[19, 20].

RESULTS AND DISCUSSION

Morphological evaluation

Sl. No	Parameters	F1HC	F2HC	F3HC
1	Colour	Light green	Light green	White
2	Texture	Smooth	Smooth	Grittiness
3	State	Semisolid	Semisolid	Semisolid
4	Odour	Pleasant	Pleasant	Pleasant

Table 4: Physical parameters

Physiochemical evaluation

1. Washability

Sl. No	Formulation	Washability
1	F1HC	Easily washable
2	F2HC	Easily washable
3	F3HC	Easily washable

Table 5: Washability test

2. Irritancy test

Sl. No	Formulation	Irritant effect	Erythema	Edema
1	F1HC	Nil	Nil	Nil
2	F2HC	Nil	Nil	Nil
3	F3HC	Nil	Nil	Nil

Table 6: Irritancy test

3. Phase separation

Sl. No	Formulation	Phase separation
1	F1HC	No phase separation
2	F2HC	No phase separation
3	F3HC	No phase separation

Table 7: Phase separation test

4. pH test

Sl. No	Formulation	pH
1	F1HC	Neutral pH
2	F2HC	Slightly acidic
3	F3HC	Slightly alkaline

Table 8: pH test

5. Dye test

Sl. No	Formulation	Type of emulsion
1	F1HC	w/o type emulsion
2	F2HC	w/o type emulsion
3	F3HC	w/o type emulsion

Table 9: Dye test

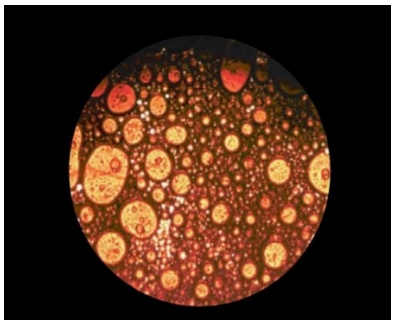

Figure 6: Microscopic view of water in oil cream

6. Spreadability

Sl. No	Formulation	Time(sec)	Spreadability (gcm/sec)
1	F1HC	7	1.4
2	F2HC	5	4
3	F3HC	6	1.6

Table 10: Spreadability test

CONCLUSION

Various batches of multipurpose herbal cream were formulated in trials (F1HC, F2HC, F3HC) using borax, liquid paraffin, beeswax and extracts of herbs such as aloe vera extract, neem extract and tulsi extract. Based on the results we can say that formulation F2HC is better formulation than F1HC and F3HC. Current research is dedicated to the potential of plant extracts for cosmetic purposes. The use of cosmetics has increased many times over in personal care systems. The use of bioactive ingredients in cosmetics affects the biological functions of the skin and provides the necessary nutrients for healthy skin. The prepared composition showed good spreadability, no signs of phase separation and good consistency during the study period.

Manufactured herbal cream uses fewer chemicals and has the best properties and nutritional value, protecting the skin from various skin troubles. Because the cream is made simply with simple ingredients, it is also economical. It is an oriental cosmetic formulation that can be used safely and acts as a skin protective film. Various test results of the cream have shown that the composition can be used topically to protect the skin from damage. Natural remedies are more acceptable than synthetic remedies because they are safer and have fewer side effects.

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