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FORMULATION AND EVALUATION OF EYE CREAM BY USING VARIOUS HERBAL DRUG

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ABSTRACT

The present work deals with the Formulation and evaluation of eye cream by using various herbal Drug prepared with orange peel powder (Rutaceae) amla powder (Phyllanthaceae)extract and Aloevera (Liliaceae) gel. Under-eye skin is extra sensitive and vulnerable to dark circles, puffiness, Dryness, and premature signs of aging caused by stress, lack of sleep, sun exposure, and Environmental conditions. The purpose of this formulation is to offer a mild substitute for chemical Cosmetics, providing therapeutic benefits through herbal ingredients. Orange peel powder has been Reported to possess intense anti-inflammatory, antioxidant, and skin-lightening activity due to the Presence of constituents such as Rutaceae. Aloe vera is well known for its moisturizing, calming, And healing effects owing to the content of polysaccharides, vitamins, and minerals. The herbal ingredients present in the formulation help to nourish and protect the delicate skin Around the eyes while minimizing the side effects commonly associated with synthetic cosmetic Products. Therefore, the formulated herbal eye cream can be considered as a safe, effective, and Economical preparation for daily skin care and management of under eye problems.The final product was analyzed for physicochemical properties like pH, spreadability, viscosity, Homogeneity, and stability. The formulation had a perfect pH for application on the skin (5.5–6.5), Exhibited smooth texture, and was stable under different conditions of storage. The findings proved The efficacy of this herbal product to correct the under-eye skin condition by diminishing Pigmentation, puffiness, and dryness and hence a potential and safe herbal cream.

KEYWORDS: Herbal Eye Cream, Orange Peel Powder, Amla Powder, Aloe Vera, Almond Oil, Rose Water, Antioxidant, Dark Circles, Skin Care, Evaluation Parameters.

1. INTRODUCTION

Creams are circumfluous conflation lozenge forms containing further than 20% water or unpredictable factors and generally lower than 50% hydrocarbons, waxes as vehicles.[1] Dark circles under the eyes, also known as "Windows of our Soul," are a common beauty issue. They give the appearance of tiredness or illness, make us feel worse, and have a negative impact on our self-esteem. The skin under the eyes is very thin, and blood passing through the large veins has a bluish tint. When the skin around the eyes becomes too thin, or when the melanin produced around the eyes is higher than.[2] The skin under the eyes is very thin and delicate, and it is very prone to environmental damage, aging signs, fatigue, and dehydration. Issues under the eyes like dark circles, puffiness, fine lines, and dryness are common and tend to be a concern for most people. Though there are several synthetic formulations present in the cosmetic industry, they can be harsh chemicals that are not only irritating to sensitive skin but also cause prolonged side effects. Therefore, there is a growing demand for herbal or natural products in skincare, particularly in sensitive skin areas such as the under-eye region. Herbal preparations have received immense popularity because they are safe, effective, and cause very few side effects. Plants such as Orange peel powder (Rutaceae) and Amla powder (Phyallanthaceae) have been extensively noted in ancient medicine and contemporary skincare due to their skin-beneficial effects. Packed with vitamins (A, C, E), minerals, enzymes, and polysaccharides, aloe vera intensely hydrates the skin, de-puffs, and regenerates skin cells. Its. Anti-inflammatory effect also soothes irritated or sensitive skin.[3] Cream is a sort of semisolid emulsion that Is meant to be applie externally. It comes in two Varieties: water in oil (w/o) and oil.

Fig. No. 1: Dark Circles.

➢ CLASSIFICATION OF CREAM

They are divided into two types

1. Oil-in-Water (O/W) creams
2. Water-in-Oil (W/O) creams

1. Oil-in-Water (O/W) creams

Cream which are composed of small droplets of oil dispersed in a continuous phase, and an emulsion in which the oil is dispersed as droplets throughout the aqueous phase is termed an oil-in-water (O/W) emulsion

2. Water-in-Oil (W/O) creams

Cream which are composed of small droplets of water dispersed in a continuous oily phase. When water is the dispersed phase and an oil the dispersion medium, the emulsion is of the water-in-oil (W/O) type.

➢ CAUSE OF DARK CIRCLE UNDER THE EYE INCLUDES

• Thinning skin under the eyes • Anemia from iron insufficiency • Overexposure to sun.

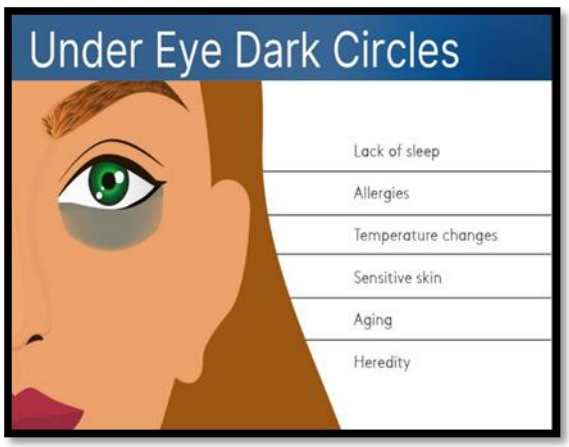

Fig. No. 2: Causes Of Dark Circles.

➢ BENEFIT OF USING DARK CIRCLES CREAM

• Reducing the Appearance of Dark Circles
• Hydrating the Under-Eye Area
• Decreasing Puffiness
• Improving Skin Elasticity
• Calming and Soothing

• Convenience and Ease of Use.[17]

➢ CHARACTERISTICS OF CREAM

1. Easy to apply.
2. Easily spread on skin.
3. Non- irritant and Non- toxic.
4. Liquefy when applied on the skin Creams.[18]

1.2 ADVANTAGES[19]

1. Reduces dark circles: Helps lighten the skin under the eyes and improve appearance.

2. Decreases puffiness: Ingredients like caffeine reduce swelling and tired-looking eyes.

3. Provides hydration: Keeps the delicate under-eye skin soft and moisturized.

4. Reduces fine lines & wrinkles:- Anti-aging ingredients smooth small lines over time.

1.3 DISADVANTAGES[20]

1. May cause irritation or allergy:- Sensitive skin may react to certain ingredients.

2. Slow results: Needs regular and long-term use to see benefits.

3. Expensive products: High-quality creams can be costly.

4. Not a complete solution: Cannot fully remove genetic dark circles or severe wrinkles.

2. DRUG AND EXCIPIENTS PROFILE

API (DRUG)

1. Orange Peel Powder

➢**Synonyms**: Citrus sinensis peel powder[21]

➢**Biological source**: Derived from the dried peels of the fruit of the sweet orange tree, scientifically known as Citrus sinensis.

➢**Genus**: Citrus

➢**Family**: Rutaceae

➢**Botanical name**: Citrus sinensis (sweet orange)

➢**Part typically used**: Fruit peel (outer rind)

➢**Colour**: Light orange to yellowish-orange

➢**Chemical Constituents** :-Flavonoids, Vitamins, Carotenoids, Pectin Fiber ,Polyphenols

Uses

1. Helps reduce dark circles and pigmentation
2. Acts as a natural exfoliant

Properties

1. Rich in Vitamin C
2. Contains antioxidants
3. Has anti-inflammatory and antibacterial properties.

Fig. No. 3: Orange peel extract.

2. Amla Powder

➢**Synonyms**: Indian gooseberry powder, Emblic powder[22]

➢**Biological source**: Obtained from the dried fruits of Phyllanthus emblica

➢**Genus**: Phyllanthus

➢**Family**: Phyllanthaceae

➢**Botanical name**: Phyllanthus emblica

➢**Part typically used**: Fruit (dried and powdered)

➢**Colour**: Light brown to greenish-brown

➢**Chemical constitution**: hydrolysis gives gallic acid, ellagic acid and glucose wherein the other gives ellagic acid and glucose.

Uses

1. Used in skin care and under-eye formulations
2. Used in Ayurvedic formulations (like chyawanprash)
3. Acts as a nutritional supplement

Properties

1. Strong antioxidant
2. Anti-inflammatory

Fig. No. 4: Amla extract.

EXCIPIENTS

3. Aloe Vera

➢**Synonyms**:- Aloe vera, burn plant[23]

➢**Biological source**:- Dried latex of leaves of it also known as cape aloe.

➢**Genus**: Aloe

➢**Family**: liliaceae

➢**Botanical name**: Aloe vera (syn. Aloe barbadensis Miller)

➢**Part typically used**: Leaf pulp (gel)

➢**Colour**: clear to slightly yellow / translucent gold

➢**Chemical constitution**:- aloe emodin, vitamins, Enzymes, Minerals, Sugars, Salicylic

Uses

1. Used in skin care products (moisturizers, creams, under-eye gels)
3. Helps reduce dark circles and puffiness

Properties

1. Moisturizing (humectant)
2. Anti-inflammatory

Fig. No. 5: Aloe Vera.

4. Almond Oil

➤**Synonyms**:- Sweet almond oil, Badam oil[24]

➤**Biological Source**:- Obtained from the seeds (kernels) of almond

➤**Genus**:- Prunus

➤**Family**:- Rosaceae

➤**Botanical Name**:- Prunus dulcis

➤**Part Typically Used**:- Seeds (kernels)

➤**Colour**:- Pale yellow to golden yellow

➤**Chemical Constitution**:- Fatty acids ,Triglycerides, Vitamin E, Phytosterols, Minerals

◈ **Uses**

2. Helps reduce dark circles and dryness
3. Used in massage oils

◈ **Properties**

1. Emollient (softens and smoothens skin)
2. Moisturizing
3. Anti-inflammatory
4. Improves skin elasticity

Fig. No. 6: Almond oil.

5. Rose Water

➤**Synonyms**:- Rose hydrosol, Gulab jal[25]

➤**Biological Source**:- Obtained by steam distillation of fresh rose petals

➤**Genus**:- Rosa

➤**Family**:-Rosaceae

➤**Botanical Name**:- Rosa damascena

➤**Part Typically Used**:- Fresh petals

➤**Colour**:- Clear and colorless

➤**Chemical Constitution**:- Essential oils ,Flavonoids ,Phenolic compounds,Tannins

◈ **Uses**

1. Used as a skin toner
2. Used in under-eye creams and face packs
3. Helps reduce dark circles and puffiness
4. Used as a refreshing facial mist

◈ **Properties**

1. Astringent
2. Soothing and cooling

Fig. No. 7: Rose water.

EXCIPIENTS AND ROLES

Table No. 1: Excipients and roles.

Sr. No	EXCIPIENTS NAME	ROLES
1.	Orange peel powder	Reduce dark circle
2.	Amla powder	Antioxidant
3.	Aloevera gel	Antiageing, Moisturizer
4.	Almond oil	Help to regenerate skin cell
5.	Stearic acid	Emulsifier
6.	Cetyl alcohol	Emulsifier, Emollient
7.	Potassium hydroxide	Stabilizer
8.	Sodium hydroxide	Help to adjust PH
9.	Triethanolamine	Help to adjust PH
10.	Glycerin	Moisturizing agent
11.	Methyl paraben	Preservative
12.	Rose water	Vehicle
13.	Vitamin E Capsule	Antioxidant
14.	Distilled water	Vehicle

3. METHODOLOGY[26]

1. Orange peel powder

a) Collection of Plant Material

• Fresh, ripe oranges are collected from orchards or local markets

• Select healthy, disease-free fruits

• Avoid spoiled or damaged oranges.

b) Washing

• Wash fruits thoroughly with clean running water

• Removes dust, pesticides, and contaminants.

c) Drying

• Cut peels into small pieces for uniform drying

• Dry under shade (preferred) or mild sunlight

• Continue drying until peels become completely crisp and moisture-free

• Proper drying prevents fungal growth and preserves active compounds.

d) Grinding into Powder

• Dried peels are ground using mixer/grinder

• Powder is passed through a sieve to get fine uniform powder.

2. Amla powder

a) Collection of Plant Material

• Fresh amla fruits are collected

• Select mature, greenish-yellow, healthy fruits

• Avoid infected or overripe fruits.

b) Washing

• Wash thoroughly with clean water

• Removes dirt and impurities.

c) Drying

• Spread pieces on clean tray

• Dry under shade or tray dryer

• Continue drying until pieces are completely dry and hard

• Shade drying helps retain vitamin C.

d) Grinding into Powder

• Dried pieces are ground into fine powder

• Sieve to obtain uniform particle size

4. PROCEDURE[29,30]

Phase A: Oil Phase

The emulsifying agent stearic acid was dissolved in cetyl alcohol then almond oil added and heated at 75 °C. Oil phase was prepared.

Phase B: Aqueous phase

To prepare this phase, some water soluble compounds like methyl paraben, Triethanolamine, sodium hydroxide, potassium hydroxide added in water. Then heated at 75°C. Aqueous phase was prepared.

Phase C: Herbal phase

Glycerin and Aloevera gel were added in orange peel powder and Alma powder. Mixed properly after that vitamin E capsule and were then quantity sufficient rose water was added. After the completion of heating of aqueous phase it was added into the oil phase at same temperature with continuous trituration the smooth and homogenous cream was prepared. After fall in temperature at 45 °C herbal phase were added and triturated.

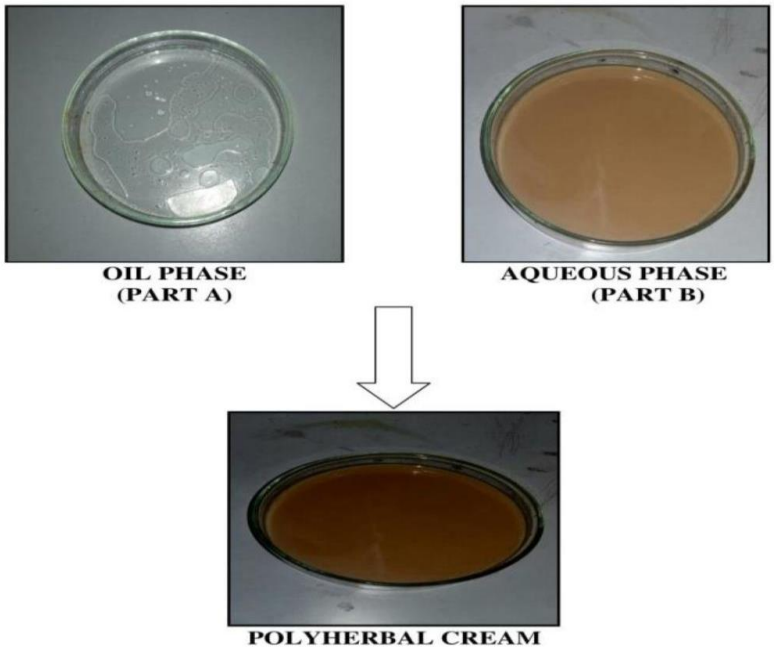

Fig. No. 8: Phase Of Formulation.

➢ **FORMULATION OF CREAM**

Table No. 2: Formulation of cream.

Sr. No	Ingredient	F1	F2	F3	F4	F5
1	Orange peel powder	1.5 gm	1 gm	1.5 gm	0.5 gm	1 gm
2	Amla powder	1 gm	1 gm	1.5 gm	0.5 gm	1 gm
3	Aloevera gel	1 ml	2 ml	1 ml	4 ml	3 ml
4	Almond oil	1 ml	2 ml	1 ml	2 ml	3 ml
5	Stearic acid	9 gm	4 gm	6 gm	2 gm	3 gm

6	Cetyl alcohol	0.25 gm	1 gm	0.25 gm	0.8 gm	1 gm
7	Potassium hydroxide	0.1 ml	0.1 ml	0.1 ml	0.05 ml	0.08 ml
8	Sodium hydroxide	0.08 ml	0.05 ml	0.08 ml	0.03 ml	0.05 ml
9	Triethanolamin	0.6 ml	0.5 ml	0.6 ml	0.4 ml	0.5 ml
10	Glycerin	5 ml	3 ml	5 ml	4 ml	3 ml
11	Methyl paraben	0.02 gm	0.1 gm	0.02 gm	0.05 gm	0.05 gm
12	Rose water	0.01 ml	5 ml	4 ml	10 ml	8 ml
13	Vitamin E Capsule	0.5 ml	0.5 ml	0.5 ml	0.5 ml	0.5 ml
14	Distilled water	Upto 30 ml	Upto 30 ml	Upto 30 ml	Upto 30 ml	Upto 30 ml

5. EVALUATION TEST

1. Physical evaluation

This checks the general appearance of the cream such as color, odor, texture, consistency, and homogeneity. It ensures the product looks acceptable and is uniform.[31]

Fig. No. 9: pH determination.

2. pH Determination

The pH of the cream was determined by a digital pH meter. Distilled water was used, and a small amount of the cream was dispersed in it, and this was analyzed. The pH for under-eye usage should range from 4.5 to 6.5 in order to ensure the natural pH of the skin and prevent irritation.[32]

3. Viscosity

Viscosity refers to the thickness or resistance to flow of the cream. It affects how easily the product can be applied and its stability.[33]

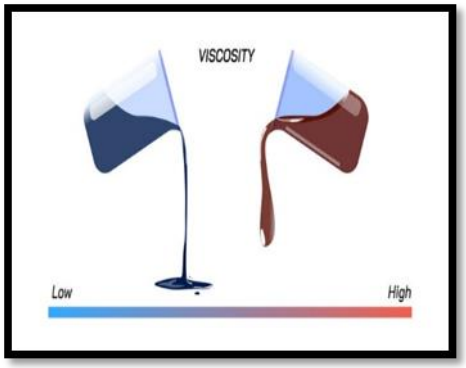

Fig. No. 10: Viscosity.

4. Spreadability

The spreadability was measured by the time it took two slides to slip away from the cream, which was placed in between the slides, under a specific force. The better the spread ability, the less time it takes to separate the two slides. Two sets of standard-sized glass slides were taken. The cream mixture was then placed on a slide of appropriate size. The formulation was then placed on top of another slide. The cream between the two slides was then pushed uniformly to form a thin layer when a weight or specified load was placed on the upper slide.[34]

$$\textbf{Spreadability} = m \times l/t$$

Where,

S - Spreadability

m - Weight tied to upper glass slide.

l - Length moved on a glass slide

t - Time taken

5. Stability Studies:- The cream was kept at room temperature, refrigeration temperature, and in humidity chambers for 30 days. It was stable with no change in color, odor, or texture, and had no microbial contamination.[35]

6. Skin Irritation Test

Few drops of cream were put on the inner forearm and inspected for 24 hours. No irritation, redness, or itching was observed, ascertaining that the formulation is safe for sensitive skin regions.[36]

Fig. No. 11: Skin Irritation test.

7. Washability

The cream was put on the skin and washed away with water. It was washable with ease without any greasy feeling, demonstrating user-friendly washoff properties.[37]

Fig. No. 12: Washability.

6. RESULT

1. Physical evaluation

In this test colour, odour and texture were checked.

Table. No 3: physical evaluation.

Sr. No	Batch No	Colour	Odour	Texture
1.	F1	Light brown	Pleasant	Smooth
2.	F2	Light brown	Pleasant	Smooth and soft
3.	F3	Light brown	Pleasant	Slightly smooth
4.	F4	Light brown	Pleasant	Uniform thin
5.	F5	Light brown	Pleasant	Smooth

2. pH Determination

According to the result the pH of all five formulation that is F1, F2, F3, F4, and F5 was found to be nearer to skin pH so it can be safely use on the skin. (5.5 – 6.5).

Table. No 4: pH determination.

Sr. No	Batch No	pH
1.	F1	4.5
2.	F2	5.8
3.	F3	4.7
4.	F4	4.9
5.	F5	6.0

3. Viscosity

The viscosity of all formulation was determined and it was observed.

Table. No 5: Viscosity.

Sr. No	Batch No	Viscosity (cps)
1.	F1	12,500
2.	F2	13,200
3.	F3	14,000
4.	F4	13,500
5.	F5	12,800

4. Spreadability

The spread ability of all formulation was determined and it was observed that formulation F2 has greater spread ability as compared to other formulation.

Table No. 6: Spreadability.

Sr. No	Batch No	Spread ability (g.cm/sec)
1.	F1	6.2
2.	F2	6.5
3.	F3	6.8
4.	F4	6.4
5.	F5	6.1

5. Stability test

The samples are observed for a specific period (15–30 days).

Table No. 7: Stability test.

Sr. No	Batch No	Colour change	Phase Separation
1.	F1	No change	No Phase Separation
2.	F2	No change	No Phase Separation

3.	F3	No change	No Phase Separation
4.	F4	No change	No Phase Separation
5.	F5	No change	No Phase Separation

6. Skin irritation test

All formulation showed no sign of irritancy.

Table No. 8: Skin irritation test.

Sr. No	Batch No	Irritancy
1.	F1	No Irritancy
2.	F2	No Irritancy
3.	F3	No Irritancy
4.	F4	No Irritancy
5.	F5	No Irritancy

7. Washability

The result observed F2, F3 and F5 was easily washable. And F1, F4 was taken few second.

Table No. 9: Washability.

Sr. No	Batch No	Wash ability
1.	F1	Taken few sec.
2.	F2	Easily washable
3.	F3	Easily washable
4.	F4	Taken few sec.
5.	F5	Easily washable

7. CONCLUSION

In conclusion, the formulation and evaluation of eye cream by using various herbal drug with Orange peel powder, Amla powder and Aloevera gel both of which have skin-soothing, depigmenting, and rejuvenating properties. The cream showed desirable physical properties like suitable pH, smooth texture, and ease of spread ability, thus being appropriate for sensitive under-eye skin. The purpose of the study was to prepare antimicrobial herbal eye cream using locally available plants. On the basis of antimicrobial efficacy, different local plants were taken and their extracts were incorporated in the most effective ratio in appropriate base. The final product readily spread on skin surface, showed no irritant effect, diffused well and was stable at different temperatures. Formulating and evaluating a herbal eye cream involves a series of tests to ensure its quality. safety, and efficiency. A study on herbal eye cream found that the pH was in the range of 5.8, which is considered good for skin. In a non-irritancy test, all formulations showed no signs of irritation. In a wash ability

test, final batch result are easily washable. The prepared eye cream with cultural ingredients like orange peel powder extract, aloe vera and amla powder which enhance the property of formulation and show effectiveness. The formulations, batch by batch improved results, the final formulation F2 have good spread ability, viscosity and wash ability. This eye cream are reduce dark circle the skin, lightening the skin and protect for the harmful sunrays also it is used to treat the based of result this eye cream is safe, efficient and non toxic of natural ingredients used in formulation.

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