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FORMULATION AND EVALUATION OF POLYHERBAL PEEL OFF FACE MASK

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ABSTRACT

The increasing demand for natural skincare products has led to the development of polyherbal peel-off face masks, which combine multiple herbal ingredients like Pomegranate peel, Caffeine, Green Tea, Neem, Turmeric, Aloe, Beetroot known for their skin health benefits such as wound healing, UV protection, anti-acne, and anti-aging. By replacing synthetic preservatives with natural herbs, these masks offer a safer alternative. The formulation uses polyvinyl alcohol and hydroxypropyl methylcellulose in varying ratios for film formation, while rose water provides a soothing fragrance. Laboratory-scale formulations have been evaluated for safety and efficacy, ensuring their effectiveness in addressing various skin concerns.

KEYWORDS: Peel-off mask, Poly herbs, Poly vinyl alcohol, Peel off test, Spreadability.

INTRODUCTION

Polyherbal peel-off face masks are a popular skincare solution that combines multiple natural herbal ingredients to cleanse, exfoliate, hydrate, and rejuvenate the skin. These masks offer various benefits, including deep cleansing, pore tightening, detoxification, and brightening. They help remove dead skin cells, impurities, and excess oils while promoting hydration and reducing inflammation. With ingredients like Aloe Vera, Green Tea, and Turmeric, these masks are also known for their antioxidant, anti-aging, and soothing properties, making them suitable for different skin types and concerns. The peel-off process leaves the skin smoother,

clearer, and refreshed.

ANATOMYOF SKIN

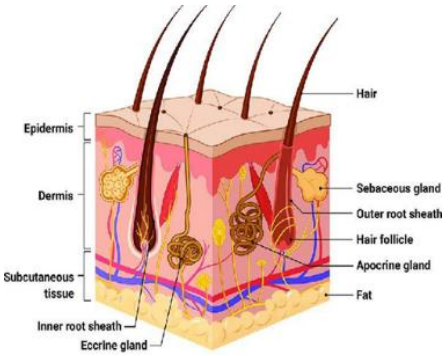


Fig. No. 1: Structure of Skin.

1. Epidermis (Outer Layer)

The epidermis is the outermost layer of skin, primarily made up of keratinocytes (cells that produce keratin, a tough protein).

Strata (layers) of the Epidermis

1. Stratum corneum: The outermost layer, consisting of dead, flattened cells that are continuously shed and replaced. These cells are filled with keratin and form a tough, waterproof barrier.
2. Stratum lucidum: A thin, clear layer found only in thick skin (palms of hands, soles of feet).
3. Stratum granulosum: Contains cells that produce lipids and keratin, which contribute to the waterproof nature of the skin.
4. Stratum spinosum: A layer where cells begin to flatten as they move upwards, also containing Langerhans cells, which are involved in immune responses.
5. Stratum Basale (or stratum germinativum): The deepest layer where new skin cells are produced. This layer also contains melanocytes, which produce melanin (pigment responsible for skin color). Melanocytes: Found in the Stratum Basale, these cells produce melanin to protect the skin from UV radiation and give the skin its color.

2. Dermis (Middle Layer)

The dermis lies beneath the epidermis and is much thicker. It is made of connective tissue and provides structural support and elasticity to the skin.

Components of the Dermis

- Collagen and Elastin fibers : Provide strength, flexibility, and elasticity to the skin.
- Fibroblasts : Cells that produce collagen and other fibers.
- Blood vessels : Supply oxygen and nutrients to the skin and help with thermoregulation.
- Hair follicles : Structures from which hair grows.
- Sweat glands : Produce sweat for thermo regulation and excretion.
- Sebaceous glands : Secrete sebum(oil) to lubricate the skin and hair.
- Nerve endings : Allow the skin to sense touch, pain, temperature, and pressure.

The dermis is divided into two layers

1. Papillary layer : The upper layer of the dermis, which contains thin collagen fibers and capillaries. It forms the fingerprints (dermal papillae) that help with grip.
2. Reticular layer : The deeper, thicker part of the dermis, consisting of dense connective tissue with thicker collagen fibers. It contains larger blood vessels, hair follicles, and deeper nerve endings.

3. Hypodermis (Subcutaneous Tissue)

The hypodermis, also called the subcutaneous layer, lies beneath the dermis and connects the skin to underlying muscles and bones. It is composed mainly of fat and loose connective tissue.

Functions of the Hypodermis

1. Insulation : Fat cells store energy and help regulate body temperature by providing insulation.
2. Cushioning : The hypodermis helps protect underlying organs from trauma.
3. Anchoring : It connects the skin to deeper structures like muscles and bones.

POLY HERBAL PEEL OFF FACE MASK

A Poly herbal Peel-off Face Mask is a skin care product made from a blend of various herbs, plants, or botanicals, each chosen for its specific skin benefits like moisturizing, detoxifying, anti-aging, and soothing properties. These masks work by forming a thin film that, once dried, can be peeled off to remove dead skin cells, impurities, and excess oils, leaving the skin smoother, clearer, and more radiant. The combination of multiple herbs enhances the

mask's effectiveness, addressing different skin concerns in one product, making it a natural and holistic solution for deep cleansing, exfoliation, and rejuvenation.

BENEFITS OF POLYHERBAL PEEL OFF FACE MASK

1. Hydration and Moisture
2. Cleansing and Detoxifying
3. Improved Skin Tone
4. Exfoliation

FUNCTION OF POLY HERBAL PEEL OFF FACE MASK

- Deep Cleansing
- Exfoliation
- Pore Tightening and Minimizing.
- Detoxification
- Skin Brightening
- Hydration and Moisturization
- Anti-inflammatory and Soothing
- Anti-aging and Firming
- Reducing Acne and Breakouts

MATERIALS AND METHODS

HERBAL INGREDIENTS

1. POMEGRANATE PEEL

Synonym : Wine - Apple

Biological source : The pomegranate is a fruit-bearing deciduous shrub Punica granatum.

Family : Lythraceae.

Chemical Constituents

Pomegranate is rich in various chemical constituents, including antioxidants like polyphenols, flavonoids, and anthocyanins, as well as vitamins, sugars, and fatty acids.

Figno: 2-Pomegranate peel powder.

2) CAFFEINE

Synonym : Caffeine

Biological source : It is obtained from the dried ripe fruits of coffee arabica.

Family : Rubiaceae

Chemical constituents

Methyl Xanthine alkaloid, Paraxanthine (80%) Theobromine (12%) Theophylline (4%)

Figno: 3- Caffeine powder.

3) TURMERIC POWDER

Synonym : Indian saffron

Biological source : Turmeric consist of dried as well as fresh rhizomes of the plant Curcuma longa.

Family : Zingeberaceae.

Chemical constituents

Curcumin (50%), Essential oil (2-7%) with high content bisabolene derivatives, bis des methoxy curcumin (BDMC), Desmethoxycurcumin (DMC), Common Phyto sterols, zingiberene, fatty acids, polysaccharide.

Figno: 4-Turmeric Powder.

4) NEEM POWDER

Synonym **:** Margosa

Biological source : Neem consist of the fresh or dried leaves and seed oil of

Azadiracta indica.

Family : Meliaceae

Chemical constituents

Neem consist of quercetin, Nimbin (leaf) Nimbosterol, Kaempferol, Melicitrin (flower), Nimbin, Nimbidin, Nimbosterol, Margosine (Bark), Azadirachtin, Azadiradione, Nimbin, Vepinin (Seed).

Fig No. 5 – Neem Powder.

5) GREEN TEA

Synonym : Camelliasinesis

Biological source : It is obtained from ever green shrub or small tree leaves and leaf buds of plant known as Camellia sinesis.

Family : Theaceae

Chemical constituents

Green tea consists of Caffeine, Theophylline, Theobromine, Theanine.

Figno:6- Green tea.

6) ALOE

Synonym : Aloe

Biological source : Dried juice collected by incision from the bases of the leaves of various species of Aloe barbadense (Curacao aloes) Aloe spicata (Cape aloes) Aloe perryi

(Socotrine aloes) Aloe ferox.

Family : Liliaceae

Chemical constituents

Aloe Chemical Constituents of Barbaloin, Beta barbaloin, Iso barbaloin, Aloinoside A, Aloinoside B, Capalo resino tannol, emodin, anthrone, Glucose, also contains Aloe-emodin anthranol and Aloeemodin Hydrolysis.

Properties: Hydrating and moisturizing, acne treatment, healing and repairing, sunburnrelief, reduce hyperpigmentation and dark spots.

Fig no:7 Aloe powder.

7) BEETROOT

Synonym : Red beet

Biological source : Beetroot is a vegetable which is obtained from the taproot of Beta vulgaris.

Family : Amaranthaceae.

Chemical constituents

Beetroot contains many biologically active phytochemicals, including betalains, flavonoids, polyphenols, and saponins. Beetroot is also a rich source of minerals such as potassium, sodium, phosphorous, calcium, magnesium, copper, iron, zinc, and manganese.

Properties: Reduce dark circles, support collagen production, natural colorant, skin brightening.

Fig no: 8 Beet root powder.

METHODOLOGY

GENERALPROCEDURE

1) To begin, accurately measure all the ingredients.
2) Dissolve methyl paraben and propyl paraben insufficient amount of water.
3) The film forming agent (HPMC&PVA) dissolve in water.
4) Mix the required quantity of powders of pomegranate peel, caffeine, neem, turmeric, green tea, aloe, beetroot.
5) Film formers are added to the above mixture.
6) Then ethyl paraben was added to above formulation.
7) Add enough quantity of glycerin in the formulation.
8) After that, the rose oil was added in the formulation to enhance the odor of product.
9) Then the formulation was placed in electric stirrer for 20 min for proper mixing.
10) At the end fill the formulation into the well label and airtight container.

FORMULATION CHART

Table no: 1 Formulation chart.

SL NO	INGREDIENTS	F1	F2	F3	F4
1	POMEGRANATE PEELPOWDER	8.3%	8.3%	8.3%	8.3%
2	CAFFEINE	2.6%	2.6%	2.6%	2.6%
3	NEEMPOWDER	3.3%	3.3%	3.3%	3.3%
4	GREEN TEA	2.6%	2.6%	2.6%	2.6%
5	TURMERIC	3.3%	3.3%	3.3%	3.3%
6	ALOE	2.6%	2.6%	2.6%	2.6%
7	BEETROOT POWDER	2.6%	2.6%	2.6%	2.6%
8	PVA	15%	13%	11%	10%
9	HPMC	2.66%	2.66%	2.66%	2.66%
10	METHYLPARABEN	0.23%	0.23%	0.23%	0.23%
11	GLYCERIN	10%	10%	10%	10%
12	ROSEWATER	2%	2%	2%	2%

EVALUATION

1) **PHYSICAL EVALUATION:** Physical characteristics such as color, appearance, consistency, and texture were checked for the prepared formulation.

Color : The formulation's color was checked against a white background.

Consistency : The consistency was determined by applying the formulation onto the skin.

Smoothness : Smoothness of formulation evaluated by applying the formulation onto the skin Odor : The odor of the gel was examined by mixing the gel in water and observing the Odor.

2) **DETERMINATION OF pH:** The pH of the formulation was determined using a digital pH meter. Before usage, the pH meter was calibrated using Standard buffer solutions at pH 4,7.

3) **PEEL OFF TEST:** After application, the peel off gel was uniformly spread over the face and hands and allowed to dry. Research suggests that the ideal drying period for the peel-off gel mask typically spans between 15 to 30 minutes. Employing a stopwatch, the drying duration of the gel mask was found to be 18 minutes. Subsequently, once fully dried, the mask was effortlessly peeled off from the skin's surface without any fragmentation, as demonstrated in the accompanying illustration.

4) **SPREADABILITY:** To assess spreadability, surplus sample gel was sandwiched between two glass slides and pressed to a consistent thickness by applying a weight of 5grams on the upper slide. The duration for which the upper glass slide took to separate from the lower plate, indicating spread ability 20 S= m X 1/t. S- spreadability.

5) **REMOVAL TEST:** The peel off face mask was applied on the skin was handily taken out by peeling.

6) **DRYING TIME:** A small amount of mask was applied on the skin and left for a few minutes. The time was noted until it dried and formed a thin layer of mask.

7) **VISCOSITY:** The viscosity of the gel formulation was determined by using Brookfield viscometer, samples spindle no.3 and a speed of 30 rpm. The value of the viscosity is displayed in the form of cP.

RESULTS AND DISCUSSIONS

1) PHYSICALEVALUATION

Physical characteristics such as color, appearance, consistency, and texture were checked for the prepared formulation.

Table no. 2: Observations of Physical Evaluation.

Sl No.	Parameter	Observation
1	Color	Reddish brown
2	Odor	Aromatic
3	Consistency	Paste
4	Smoothness	Smooth

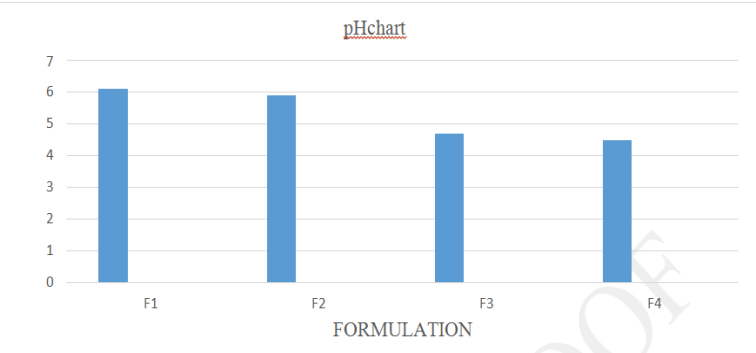
2) DETERMINATION OF pH

The pH of the formulation was determined using a digital pH meter.

Table no. 3: Observations of pH.

Sl No.	Formulation	pH
1	F1	6.1
2	F2	5.91
3	F3	4.7
4	F4	4.5

Fig no: 9 Evaluation of pH.



Graph no: 1 pH chart.

3) PEEL OFF TEST

After application, the peel off mask was uniformly spread over the face and hands and allowed to dry. Research suggests that the ideal drying period for the peel-off gel mask typically spans between 15 to 30 minutes.

Table no: 4 Observations of peel off test.

Sl No.	Formulation	Peel off Test
1	F1	Good
2	F2	Excellent
3	F3	Good
4	F4	Satisfactory

Fig no: 10 Peeling of mask.

4) SPREADABILITY TEST

A spreadability test for a peel-off mask measure show easily the mask can spread across the skin when applied. A good spreadability indicates the mask can be smoothly applied with out clumping or dragging on the skin.

Table no: 5 Observations of Spreadability test.

Sl No.	Formulation	Spreadability value
1	F1	7.1
2	F2	6.9
3	F3	6.7
4	F4	6.5

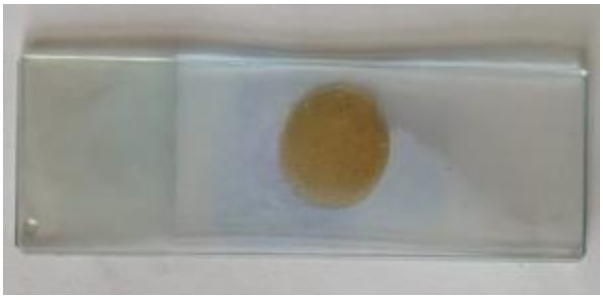
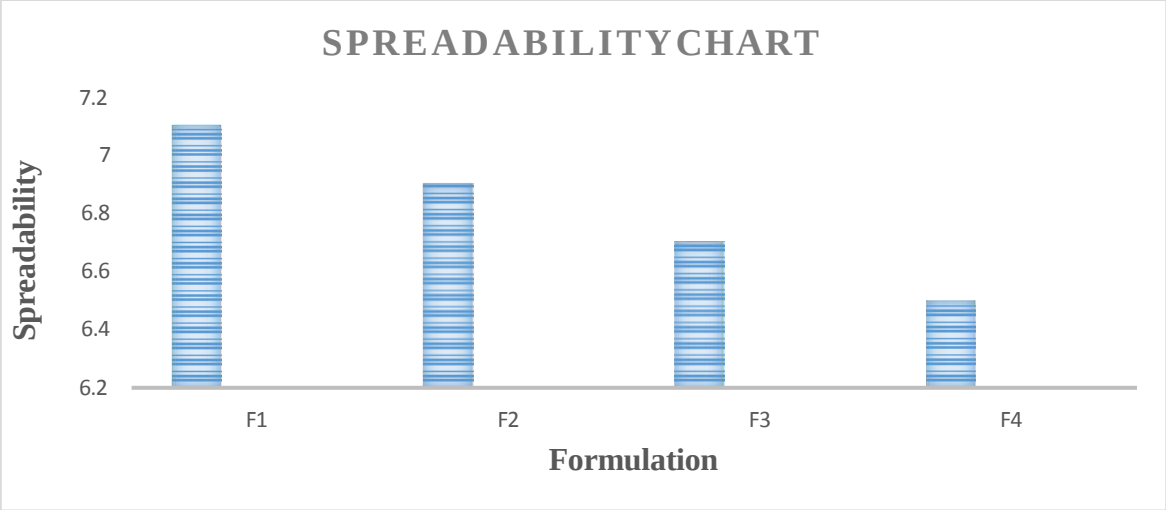


Fig no:11 Spreadability test.



Graph no: 2 Spreadability Chart.

5) REMOVALTEST

A peel-off mask remove at least involves applying a peel-off mask to the skin, allowing it to dry, and then removing it. The mask is usually removed with the fingers.

Table no: 6 Observations of removal test.

Sl No.	Formulation	Removal test
1	F1	PASS
2	F2	PASS
3	F3	PASS
4	F4	PASS

Figno:12 On application.

Figno:13 Removal of peel off mask.

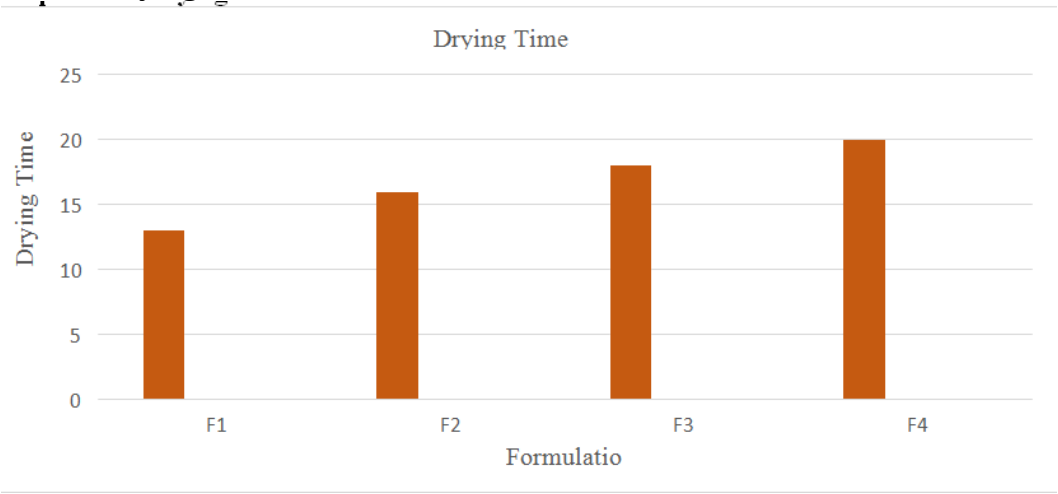
6) DRYINGTIME

A small amount of mask was applied on the skin and left for a few minutes. The time was noted until it dried and formed a thin layer of mask.

Table no 7: Observations of Drying Time.

Sl No.	Formulation	Drying Time
1	F1	13
2	F2	16
3	F3	18
4	F4	20

Graph no: 3 Drying Time Chart.



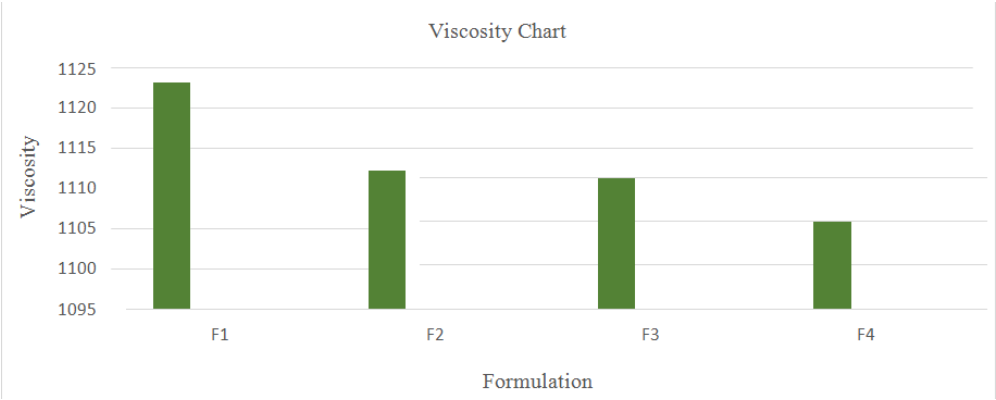
7) VISCOSITY

The viscosity of the formulation was determined by using Brook field viscometer, sample spindle no.3 and a speed of 30 rpm. The value of the viscosity is displayed in the form of cP.

Table no: 8: Observations of Viscosity.

Sl No.	Formulation	Viscosity
1	F1	1123.1
2	F2	1112.2
3	F3	1109.7
4	F4	1104.5

Fig no: 14 Brook field viscometer.



Graph no:4 Viscosity Chart.

CONCLUSION

Herbal formulations are often preferred due to their perceived safety and lower risk of side effects compared to synthetical alternatives. Peel-off mask is considered an effective and beneficial method for enhancing the skin's appearance. This study focuses on the development of a poly herbal peel off mask using naturally sourced ingredients such as pomegranate peel powder, neem powder, turmeric powder, aloe powder, green tea, caffeine, beetroot powder will be a better option for synthetic coloring agent. The aim of formulating poly herbal peel off face mask was found to successful with good result. This peel off mask shows good compatibility with all type of skin.

Comparing the evaluation parameters of F1, F2, F3, F4 we found that F2exhibits excellent peel off property, spreadability, viscosity, pH and drying time, therefore its formulation found better than other formulations. This peel off mask showed an excellent peeling effect on human skin without any irritation and itching and without leaving any residue. It provide glow to the skin, clean the skin pores and it also moisturizes and hydrates the skin.

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