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# FORMULATION AND EVALUATION OF HERBAL FACEPACK USING CHAMOMILE FOR THE TREATMENT OF ECZEMA AND PSORIASIS

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## ABSTRACT

This study focuses on the formulation and evaluation of a polyherbal face pack developed for the management of inflammatory skin conditions such as eczema and psoriasis. Matricaria chamomilla (Chamomile) was selected as the primary bioactive ingredient due to its well-known anti-inflammatory, antioxidant and skin-soothing properties. The face pack was formulated and optimized for topical application. The prepared formulation was subjected to various evaluation parameters, including organoleptic characteristics and physicochemical tests such as pH and moisture content. Stability studies were also carried out at different temperatures, along with analytical evaluation using thin-layer chromatography (TLC). The results demonstrated that the formulation was stable and exhibited desirable properties, indicating its potential effectiveness in managing inflammatory skin conditions.

**KEYWORDS:** Matricaria chamomilla, Polyherbal face pack, Eczema, Psoriasis, Anti-inflammatory and Antioxidant.

## INTRODUCTION

A face pack is a powdered skincare blend applied to the face to refresh and nourish the skin.

Herbal face packs provide natural nutrients and are made to suit different skin types. They are mixed into a paste, applied evenly, and left to dry for a few minutes. As the pack dries, it tightens the skin and absorbs dirt and excess oil. After removal, the skin feels clean, smooth, and rejuvenated.[1]

Eczema is a common skin condition that causes inflammation and irritation. The name comes from a Greek word meaning "to boil over," reflecting how the skin can look red and inflamed. Its exact cause is still unknown, but symptoms often include itching, redness, dryness, scaling, and sometimes oozing. It can affect both children and adults and often flares up from time to time.[2]

Psoriasis is a chronic skin condition caused by an over active immune system. It occurs in several forms, with plaque psoriasis being the most common. The disease often runs in families, showing a strong genetic link. Psoriasis commonly affects areas such as the scalp, nails, palms, soles and joints like the elbows and knees. It can appear at different ages and affects both men and women, sometimes starting earlier in women.[3]

## MATERIALS AND METHODS

### 1. CHAMOMILE POWDER

Chamomile consists of the dried flowers of Chamomilla recutita, Chamaemelum nobile and belongs to the family Asteraceae. It is also known by synonyms such as Karpurapuspa, Baboona, and Matricaria chamomilla. Chamomile is a daisy-like medicinal plant widely used in traditional medicine for the treatment of inflammation-related disorders. Two main types are existed, German chamomile and Roman chamomile with German chamomile being more commonly used for skin disorders such as eczema. Chamomile contains important chemical constituents such as volatile oils, chamazulene, bisabolol, polyphenols and related compounds. It exhibits anti-inflammatory, antioxidant, and calming properties.[4] Chamomile is widely used in cosmetics, herbal preparations and teas. It is especially valued for the treatment of eczema and other inflammatory skin conditions.[5]

### 2. DANTHAPALA OIL

Wrightia tinctoria is obtained from the leaves of the plant and belongs to the family Apocynaceae. It is commonly known as Sweet Indrajao, Pala indigo plant, Dyer's oleander and Vetpalai. Wrightia tinctoria contains a wide range of bioactive compounds including alkaloids, flavonoids, terpenoids, phenolics, saponins, tannins, steroids, and glycosides. Other

important constituents such as indirubin, indigotin, lupeol, ursolic acid, oleanolic acid and beta-amyrin contribute to its therapeutic activity. The plant exhibits several pharmacological properties, including anti-inflammatory, anti-microbial, ant-oxidant, wound-healing, anti-fungal, and anti-diabetic activities. It is widely used in the treatment of fungal skin infections and dandruff. Wrightia tinctoria is also commonly used for managing inflammatory skin conditions such as eczema, dermatitis and psoriasis.[6]

### 3. MULTANI MITTI

Multani mitti is a natural clay of mineral origin composed mainly of hydrated aluminum silicates, along with various amounts of magnesium, calcium and iron. It is commonly known as Fuller's Earth, Bentonite clay, Multan clay, Gile Multani and several other traditional names. The clay is white to yellowish in color, odorless and tasteless. Multani mitti contains important constituents such as silica, iron oxide, lime, magnesium, calcium, sodium, bentonite, and montmorillonite. It possesses excellent oil-absorbing, cleansing, cooling, anti-microbial and anti- inflammatory properties. The clay also exhibits anti-oxidant and anti-aging effects that helps improve the skin tone. It is widely used as a natural cleanser to remove excess oil, acne, blackheads, and blemishes. Multani mitti helps soothe sunburn, brighten complexion and improve overall skin appearance.[7]

### 4. ALOE VERA

Aloe vera which is also called as Aloe barbadensis, Aloe indica, Barbados aloe, Kumari, or Lu hui, belongs to the Asphodelaceae or Liliaceae family. The gel found in the thick, fleshy leaves of the plant, is widely used for both medicine and skin care. Aloe vera gel is known for its anti-inflammatory, antioxidant, antimicrobial, and anti-fungal properties, making it excellent for healing cuts, wounds, burns and blisters. It is often applied to treat skin problems like dermatitis, psoriasis and allergies, while also helping to reduce wrinkles, acne, dark spots and blemishes.

The gel nourishes and moisturizes the skin, keeping it healthy and glowing. Because of all these benefits, Aloe vera is considered a highly valuable plant in both traditional remedies and modern healthcare.[8]

### 5. ROSE WATER

Rose water is also called as Gulabjal, Gulab arka, rose hydrosol, Panineer, or Attar of Roses, is derived from the petals of roses, mainly Rosa damascena, along with Rosa centifolia and

Rosa gallica. These plants belong to the Rosaceae family. Red flowers, is the primary source of rose water. It is extracted through steam distillation, which preserves its natural aroma and therapeutic compounds. Rose water is highly valued in beauty and aromatherapy products for its soothing and refreshing fragrance. On the skin, it acts as a natural toner, reducing redness, acne, and the appearance of wrinkles while supporting healing of minor cuts and burns. Its antioxidant and anti-inflammatory properties protect the skin from sun damage and oxidative stress. Rose water also has soothing effects on the throat and can be used as a mild mouthwash.[9]

### 6. PHENOXY ETHANOL

Phenoxyethanol also known as 2-phenoxyethanol, ethylene glycol monophenyl ether, phenyl cellosolve, phenoxy ethyl alcohol. The molecular formula $C_8H_{10}O_2$ and a molecular weight of 138.17 g/mol. It is a colorless liquid with a faint, pleasant aromatic odor and a specific gravity ranging from 1.105 to 1.113 at 20°C. It is manufactured synthetically by reacting phenol with ethylene oxide under high temperature and pressure. It is widely used as a globally approved preservative in personal care products due to its chemical stability and ease of use in various formulations. At concentrations of 1% or less, it is considered safe for skin according to European Union Cosmetics Regulations. Beyond cosmetics, phenoxyethanol functions as a stabilizer in perfumes, soaps, antiseptic solvent and an insect repellent.[10]

## METHODOLOGY

The preparation begins by sieving the dry ingredients, such as chamomile powder and Multani mitti, through a #100 sieve to obtain a fine and uniform texture. Each ingredient is then accurately weighed using a digital balance according to the selected formulation (F1, F2 or F3). The sieved powders are mixed thoroughly using a mortar and pestle to ensure even distribution, after which aloe vera gel is added and blended well. Next, one to two drops of Danthapala oil are incorporated, followed by the addition of rose water to help form the base. The mixture is stirred continuously until a smooth, consistent paste is obtained. Phenoxyethanol is then added as a preservative and mixed until it is evenly dispersed throughout the formulation. Finally, the prepared face pack is transferred into a clean, airtight container and stored in a cool, dry place to maintain its quality and prevent contamination.[11],[12]

**FORMULATION TABLE**

| INGREDIENTS | F1 | F2 | F3 |
|---|---|---|---|
| CHAMOMILE POWDER | 10 gm | 12gm | 14gm |
| DANTHAPALA OIL | 0.5 ml | 0.3ml | 0.4 ml |
| MULTANI MITTI | 8.5 gm | 9.5gm | 8gm |
| ALOE VERA GEL | 7.5gm | 9gm | 7gm |
| ROSE WATER | 1.3 ml | 1ml | 1.5 ml |
| PHENOXYETHANOL | 0.2 ml | 0.2 ml | 0.1 ml |

**EVALUATION**

**a) Organoleptic Evaluation**

The face pack was assessed for color, odor, appearance, texture and consistency using visual and touch-based observations.

**b) Physiochemical Evaluation**

- pH: Measured using a calibrated digital pH meter on a 10% dispersion in distilled water. Ideal pH ranges from 4.5–5.5.
- Spreadability: Determined by pressing the sample between glass slides under weights and calculated using the following equation:

$$S = \frac{\pi d^2}{4}$$

- Moisture Content: Measured by loss on drying. Samples were weighed, dried in a hot air oven at 100 $^0$C–108 °C and percentage loss is also calculated.

**c) Stability Studies**

The formulation was stored at room, frozen, 30 °C and 40 °C for one month, then evaluated for changes in color, odor, pH, consistency and feel.

**d) Microbial Studies**

Antibacterial activity was tested using the agar well diffusion method against E. coli and S. aureus. Zones of inhibition were measured to ensure safety.[12]

**e) Thin Layer Chromatography (TLC)**

TLC confirmed the presence of active constituents responsible for anti-inflammatory and moisturizing effects

- For detection of chamazulene: Thin layer chromatography on silica gel with chloroform, toluene in ratio 3:1 v/v as mobile phase was carried out, then spray about 8 ml of 5%

solution of sulfuric acid in ethanol then immediately by spraying 1% solution of vanilla in ethanol dry it in oven for 10 minutes.[13]

- For detection of alpha-bisabolol: Thin layer chromatography plate of silica gel was prepared and pre saturate with mobile phase consist of toluene and chloroform in 3:1 ratio and apply the sample. Then derivatize with anisaldehyde sulphuric acid spraying reagent. Then dry it on oven at 60 ℃ for 5 minutes.[14]
- For detection of apigenin: Prepare thin layer chromatography with silica gel and apply mobile phase of toluene, ethyl acetate and formic acid in 4.5: 3.5: 02 v/v ratio and sample are applied. Spray iron chloride solution as visualizing agent place it on oven until it becomes dry.[15]
- For detection of beta amyrin: Take thin layer chromatography plate made with silica gel and use hexane and ethyl acetate in 3:1 v/v ratio as mobile phase. After application of samples the vanillin sulphuric acid as visualizing agent.[16]
- For detection of lupeol: It is done in thin layer chromatography pre coated silica gel plate and apply the sample in it. Saturate with mobile phase comprising petroleum ether, ethyl acetate and acetonitrile in ratio of 8.2:1.2:0.1 v/v for 20 minutes. Then derivatize by dipping the plate in anisaldehyde sulphuric acid reagent foe 2 seconds. The plate was air dried for 30 seconds and dry it in oven for 15 minutes.[17]
- For detection of emodin: Silica gel plate is used for thin layer chromatography. After applying sample toluene: ethyl acetate: formic acid in ratio 10:2:1 v/v is applied as mobile phase. Then derivatize it with vanillin sulphuric acid and dry it in oven for few minutes.[18]
- For detection of acemannan: The pre coated thin layer chromatography plate, apply the sample and apply mobile phase consist of butanol: acetic acid: water in ratio of 10:5:1. Then vanillin sulphuric acid is used as derivatizing solution. Then dry it in oven for 10 to 20 minutes.[19]

## RESULTS

### 1. Organoleptic evaluation

Organoleptic evaluation the organoleptic parameters like colour, odour, texture and consistency of herbal face pack were evaluated.

**2. pH**

The Ph of the formulation was determined by using Ph meter to ensure that the product is safe to use.


**F3**

| SL NO | EVALUATION PARAMETERS | F1 | F2 | F3 |
|---|---|---|---|---|
| **1** | **ORGANOLEPTIC EVALUATION** | | | |
| a | Colour | Greenish brown | Greenish brown | Greenish brown |
| b | Odour | Pleasant | Pleasant | Pleasant |
| c | Texture | Fine paste without grittiness | Fine paste without grittiness | Fine paste without grittiness |
| d | Consistency | Good | Good | Good |
| **2** | **PHYSICOCHEMICAL EVALUATION** | | | |
| a | pH (normal range between 4.5-5.5) | 5.86 | 5.63 | 5.39 |
| b | Spread ability | 49.0625$mm^2$ (Spreadable) | 57.2265$mm^2$ (Spreadable) | 70.65$mm^2$ (More spreadable) |
| c | Moisture content | 13.46% | 11.22% | 10.52% |
| 3 | **STABILITY STUDIES** | | | |
| a | 30°C | No change in colour and odour but consistency became more dry | No change in colour and odour but consistency became dry | No change in colour and odour but consistency became less dry |
| b | 40°C | No change in colour and odour but consistency became more dry | No change in colour and odour but consistency became dry | No change in colour and odour but consistency became less dry |
| c | Frozen temperature | Colour and odour are constant but consistency | Colour and odour are constant but consistency | Colour and odour are constant but consistency |

| | | | | |
|---|---|---|---|---|
| | | became frozen | became frozen | became less frozen |
| d | Room temperature | No colour and odour change but consistency became harder | No colour and odour change but consistency became harder | No colour and odour change but consistency became less hard |
| **4** | **MICROBIAL STUDY** | High microbial growth | High microbial growth | Less microbial growth |
| **5** | **THIN LAYER CHROMATOGRAPHY** | | | |
| a | Chamazulene | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| b | $\alpha$-bisabolol | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| c | Apigenin | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| d | $\beta$-amyrin | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| e | Lupeol | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| f | Emodin | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |
| g | Acemannan | Appearance of blue colour | Appearance of blue colour | Appearance of blue colour |

## DISCUSSION

The study showed that the chamomile face pack has strong anti-inflammatory and moisturizing benefits due to its natural compounds. Regular use can help reduce itching, redness and scaling, common in conditions like eczema and psoriasis, while soothing and healing the skin. Chamomile works gently on multiple levels, and compounds like apigenin, bisabolol, and flavonoids calm inflammation, minimize irritation and promote faster skin recovery. Unlike stronger treatments that can irritate the skin, chamomile provides a mild yet effective alternative. It also offers antioxidant protection, helping neutralize free radicals and support skin regeneration. This makes it useful not only for flare-ups but also for long-term care of sensitive skin. Among the tested formulations F3 proved to be the most effective. It delivered the best combination of soothing, healing, and moisturizing effects. Overall, the chamomile face pack is a gentle, natural solution for maintaining healthy and calm skin.

## CONCLUSION

The polyherbal chamomile face pack brings together soothing, healing, moisturizing and anti-inflammatory benefits in one natural formulation. Many people today deal with long-term skin conditions like eczema and psoriasis, which are difficult to cure because their exact

causes are still unclear. Although both herbal and chemical treatments are available, herbal options are often preferred due to their mild nature and fewer side effects. Keeping this in mind, we developed a chamomile-based herbal face pack enriched with other natural ingredients to boost its calming and moisturizing effects. The formulation was carefully evaluated through several quality tests to ensure its safety and effectiveness. Results showed that the face pack helps nourish the skin while reducing irritation and dryness. It provides noticeable relief and improves overall skin comfort.

The study highlights its potential as a natural anti-inflammatory option for managing eczema and psoriasis. Among all formulations, F3 performed the best. It showed excellent soothing effects, maintained a balanced pH, and caused no irritation or allergic reactions.

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