

## **Formulation And Evaluation Of Herbal Cream For Treatment Of Eczema**

**Mr. Bhagwat Shankarrao Shelke , Mr. Pankaj Vishnu Vyawahare**

*Students Of Yashodeep Institute Of Pharmacy <sup>[1]</sup>, Assistant Profesof Of Yashodeep Institute Of Pharmacy <sup>[2]</sup>,  
Chhatrapati Sambhaji Nagar, Maharashtra, India,  
Under The Dr Babasaheb Ambedkar Technology University, Lonere.*

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### **Abstract:**

Millions of people worldwide suffer from eczema, a chronic inflammatory skin condition that calls for safe and efficient treatment solutions. Because of their perceived safety and effectiveness, herbal medicines have drawn attention for their potential in controlling eczema. The purpose of this study was to create and assess a herbal cream that uses natural substances that are known to have anti-inflammatory, hydrating, and skin-soothing effects in order to treat eczema.

Aloe vera, Melia dubia extract (neem), and turmeric extract were among the carefully chosen herbs used in the formulation of the herbal cream. Turmeric extract serves as an appropriate basis. Using the proper solvents, the formulation process involves removing the bioactive ingredients from the herbs and incorporating them into a cream base using normal operating procedures. The herbal cream underwent physicochemical characterization in order to evaluate its pH, spread-ability, and stability.

Furthermore, the cream exhibited noteworthy anti-inflammatory and antioxidant properties, suggesting its promise in reducing inflammation and oxidative stress associated with eczema.

**Objective:** The aim of the study was to design and develop a cream base drug delivery system containing combinational herbal drugs (melia dubia bark oil, aloe vera gel and turmeric extract) for the effective treatment of eczema disease.

### **Results:**

The formulated cream showed optimal pH, viscosity, and stability. It exhibited significant anti-inflammatory effects in vitro and reduced eczema symptoms.

### **Conclusion:**

The herbal cream holds promise as an effective and safe treatment for eczema, offering a natural alternative to conventional therapies. Further clinical validation is needed.

**Keywords:** - Eczema, Herbal cream, Formulation, Evaluation, Anti-inflammatory, Anti-eczematous

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### **I. Introduction: -**

Eczema is a severe inflammatory skin disease that affects people all over the world and is characterized by redness, itching, and the development of lesions. There has been an increase in interest in investigating complementary and alternative therapies, with an emphasis on medicinal plants, due to the potential drawbacks and adverse consequences of traditional treatment. The goal of this study is to provide light on the possible therapeutic benefits and scientific confirmation of the wide range of medicinal herbs that have been historically used to treat eczema. Plant-based treatments for a range of skin conditions, including eczema, have long been used in traditional medical systems including Ayurveda, Traditional Chinese Medicine (TCM), and indigenous healing methods. There is some suggestion that using medicinal herbs to treat eczema. The use of medicinal plants in the management of eczema is moted in the belief that nature provides a plethora of bioactive compounds with anti-inflammatory, antimicrobial und skin-heating properties. Understanding and validating these traditional practices can offer valuable insights am the development of novel, natural therapeutic for eczema. The review will explore a range of medicinal plants known for their potential efficacy in alleviating eczema symptoms.



**Figure 1 Eczema disease**

**There are several types of eczema. Each type has unique triggers that can affect your skin's barrier function, including:**

- Atopic dermatitis
- Contact dermatitis
- Dyshidrotic eczema
- Neurodermatitis.
- Nummular eczema

**Common Triggers That Cause Eczema Are:**

- Dry Weather
- Fabrics Or Clothing Material
- Makeup Or Skin Care Products
- Smoke Or Pollutants
- Stress On Your Emotional Well Being
- Touching Something Your Allergen to.

### **Eczema Treatment**

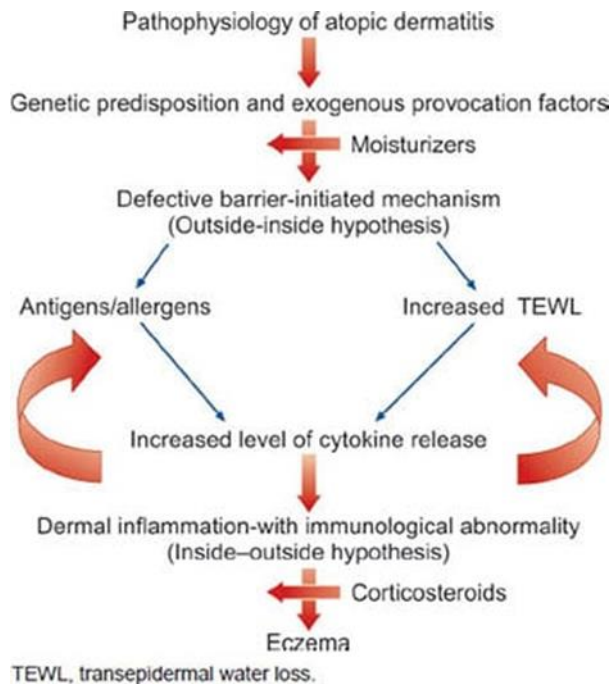
#### **Medical Treatment**

- Once your health care provider is sure you have eczema, the mainstays of therapy anti-inflammatory medication and relief from the itching.
- Prescription -strength steroid creams and antihistamine medication are the usual treatment.
- Diet restrictions and chemical skin-drying agents may also be offered, but their success is controversial
- For severe cases not responding to high-potency steroid cream, alternate treatments may be tried. These include coal tar, PUVA (psoralen ultraviolet A light), and chemotherapy agents.

#### **Self-Care at Home**

- Removing whatever is causing the allergic reaction is the easiest and most effective treatment. This may be as simple as changing your laundry detergent
- Prevent dry skin by taking warm (not hot showers rather than baths). Use a mild soap or body cleanser.
- Avoid wearing tight-fitting, rough, or scratchy clothing
- Avoid scratching the risk
- Anything that causes sweating can imitate the rash Avoid strenuous exercise during a flare.
- Apply a nonprescription steroid cream the cream must be applied as often as possible without skipping days until the rash is gone.
- Clean the area with a hypo-allergenic soap every day. Apply lubricating cream or lotion after washing.
- Avoid physical and mental stress. Eating right, light activity, and adequate sleep will help you stay healthy, which can help prevent flares.
- Do not expect a quick response. Eczema is easier to control than cure

**Pathophysiology:**



**Figure 2 Pathophysiology of eczema**

**Creams**

Cream is described as semisolid emulsions of the water in oil (w/o) or oil in water (o/w) type that are meant to be applied externally. Cream is divided into two categories: water in oil emulsion and oil in water. Its primary function is to stay longer at the application site when applied to the outer or superficial layers of the skin. A skin cream's purpose is to protect the skin from various environmental factors and weather conditions while also providing calming effects.

**Herbal Cream:**

All that the herbal cream is an oil and water emulsion. The herbal lotion was made using neem, papaya, aloe vera, turmeric, and Tulsi, among other natural ingredients. These compounds were chosen because of their special characteristics.

**Types of herbal cream:**

**Moisturizing Creams:**

These creams are made to soften and hydrate the skin, leaving it with a persistent moisture barrier. In order to seal in moisture and stave off dryness, they frequently include substances like shea butter, cocoa butter, or coconut oil in addition to herbal extracts like aloe vera, chamomile, calendula and lavender.

**Anti-Aging Creams:**

Herbal anti-aging creams are designed to improve skin elasticity and firmness while diminishing the appearance of wrinkles, age spots, and fine lines. Usually, they contain antioxidant-rich herbs like pomegranate, rosehip, ginseng, and green tea to help fight free radical damage and encourage skin rejuvenation.

**Acne Treatment Creams:**

People with oily or acne-prone skin are the target audience for herbal acne creams. They frequently contain antibacterial and anti-inflammatory herbs, such as calendula, witch hazel, neem, and tea tree oil, which help mend blemishes, relieve inflammation, and lessen acne outbreaks without irritating the skin.

**Herbal sunburn creams:**

Are intended to calm and restore sun-damaged skin, thereby mitigating the discomfort, swelling, and peeling that come with sunburn. In order to moisturize and nourish the skin, they frequently include hydrating substances like coconut oil or vitamin E together with cooling plants like aloe vera, lavender, chamomile, and cucumber.

**Creams for Scar Treatment:**

Creams for treating scars, whether they result from surgery, an injury, or acne, are made with herbs to lessen their appearance. Herbs that encourage tissue regeneration and collagen formation, such as gotu kola, comfrey, rosehip, and arnica, may be used in them. Over time, these effects can help erase scars.

**Preparation Methods:**

Preparation Method	Description
1. Infusion Method	This involves infusing dried herbs or botanicals in a carrier oil (such as olive oil, coconut oil, or almond oil) over a period of time to extract their beneficial properties. The infused oil is then combined with other ingredients like beeswax and essential oils to create a cream.
2. Double Boiler Method	In this method, herbal-infused oils and other ingredients are combined in a double boiler and gently heated until they melt and blend together. This ensures that the ingredients are heated evenly and prevents them from burning.
3. Emulsion Method	This method involves combining water-based ingredients (such as herbal teas or hydrosols) with oil-based ingredients (such as infused oils and beeswax) using an emulsifier (such as beeswax or vegetable-based emulsifying wax). The mixture is heated and blended until a creamy consistency is achieved.
4. Cold Cream Method	Cold creams are emulsions that do not require heat during preparation. Instead, they are made by blending oil-based ingredients with water-based ingredients using a high-speed blender or mixer until a smooth, creamy consistency is achieved.
5. Whipped Method	Whipped herbal creams are made by whipping together solid fats (such as shea butter or cocoa butter) with liquid oils (such as herbal-infused oils) using a hand mixer or stand mixer until a fluffy, whipped texture is achieved. This method creates a light and airy cream that is easy to apply.
6. Maceration Method	In this method, dried herbs or botanicals are macerated (crushed or ground) and then steeped in a carrier oil for an extended period to extract their properties. The infused oil is then strained and used as a base for the cream.
7. Water-in-Oil Method	This method involves mixing water-based ingredients (such as herbal teas or hydrosols) with oil-based ingredients (such as infused oils and beeswax) to form a cream where water is dispersed in oil. This method is suitable for creating rich and moisturizing creams.

**Advantages of Herbal Cream:**

**Gentle on the Skin:** Herbal creams often contain fewer harsh chemicals compared to synthetic products, making them suitable for sensitive skin types.

**Natural Ingredients:** Many herbal creams are formulated with natural ingredients such as herbs, botanical extracts, and essential oils, which can provide nourishment and hydration to the skin.

**Reduced Risk of Side Effects:** Because they typically contain fewer synthetic ingredients and preservatives, herbal creams may have a lower risk of causing adverse reactions or allergies.

**Healing Properties:** Certain herbs have known healing properties that can help with specific skin issues, such as soothing inflammation, promoting wound healing, or combating acne.

**Nutrient-Rich:** Herbal creams often contain vitamins, antioxidants, and minerals derived from plants, which can benefit the skin by providing essential nutrients and promoting overall skin health.

**Environmentally Friendly:** Many herbal creams are produced using sustainable and eco-friendly practices, making them a more environmentally conscious choice compared to products containing synthetic chemicals.

**Customizable Formulations:** Herbal creams can be customized to target specific skin concerns or preferences by selecting ingredients known for their desired effects, such as anti-aging, moisturizing, or brightening properties.

**Aromatherapeutic Benefits:** The natural fragrances of herbs and essential oils used in herbal creams can provide aromatherapeutic benefits, promoting relaxation and well-being during application.

**Long-Term Skin Health:** Consistent use of herbal creams can contribute to long-term skin health by nourishing and protecting the skin from environmental stressors.

**Cruelty-Free Options:** Many herbal cream brands are committed to cruelty-free practices, meaning they do not test their products on animals, appealing to those who prefer ethical skincare options.

**PLANT PROFILE: -**



**Figure 3 Turmeric powder**

**Turmeric: -**

**Synonym:** Curcumin, Curcuma, Curcuma aromatica, Curcuma domestica, Curcumae longa, Curcumae longae rhizome, Curcumin, Curcumine, Curcuminoid, Haldi. Common Turmeric, Indian Saffron.

**Botanical name:** - Curcuma longa

**Family:** - Zingiberacea

**Geographical source:** It is a perennial herb distributed throughout tropical and sub-tropical regions of the world including India, Pakistan, Bangladesh and Sri Lanka.

**Morphology:** Turmeric is a perennial herbaceous plant that reaches up to 1 m (3 ft 3 in) tall. It has highly branched, yellow to orange, cylindrical, aromatic rhizomes. The leaves are alternate and arranged in two rows. They are divided into leaf sheath, petiole, and leaf blade.

**Active constituent:** Curcuminoids, dimethoxy-curcumin, and bisdemethoxycurcumin, as well as volatile oils, sugars, proteins, and resins.

**Plant Part use:** - Rhizomes or underground stems.

**Medicinal properties:** - Anticancer, Antimicrobial, Anti-inflammatory, Antidiabetic and Antioxidant, etc.

**Drug Profile**

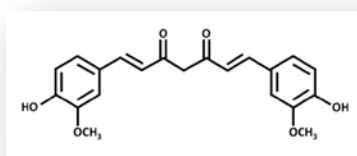


Figure 4 Structure of Curcumin

**Curcumin**

**Chemical Structure:**

Curcumin is a polyphenolic compound belonging to the curcuminoid family. Its chemical structure consists of two methoxyphenol rings linked by a seven-carbon chain containing two conjugated double bonds (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione).

**Therapeutic Uses:**

**Anti-inflammatory Conditions:** Curcumin is used to manage inflammatory conditions such as arthritis, rheumatism, and inflammatory bowel disease.

**Antioxidant Support:** It is used to combat oxidative stress and prevent age-related diseases associated with free radical damage.

**Cancer Prevention and Treatment:** Curcumin is investigated for its potential role in cancer prevention and adjunctive treatment due to its anticancer properties.

**Neurological Disorders:** It may help prevent or alleviate symptoms of neurodegenerative diseases like Alzheimer's and Parkinson's disease.

**Cardiovascular Health:** Curcumin supports heart health and may help prevent cardiovascular diseases.

**Digestive Health:** Curcumin aids digestion, supports gut health, and may alleviate symptoms of conditions like indigestion and irritable bowel syndrome.

**Skin Conditions:** It is used topically in skincare products for its anti-inflammatory and antioxidant properties, benefiting conditions like acne, eczema, and psoriasis.

**Aloe Vera**



Figure 5 Aloe vera leaves

**Synonym:** - Acemannan, Aloe africana, Aloe barbadense, Aloe capensis, aloe-coated gloves, Aloe mucilage, Aloe natalensis, Aloe Perfoliata, Aloe Perryi Baker, Aloe saponaria, Aloe spicata, Aloe vulgari, Aloe Vera Barbenoids, Aloe Vera Gel, Aloes, bitter aloe, Burn Plant, Cape Aloe.

**Botanical name:** - Aloe barbadense miller

**Family:** - Liliaceae

**Geographical source:** - Aloe species are mostly inhabitants of arid climates, and are widely distributed in Africa, India, and other arid areas.

**Morphology:** - The plant has triangular, fleshy leaves with serrated edges, yellow tubular flowers and fruits that contain numerous seeds.

**Active constituent:** - Vitamins, Enzymes, Anthraquinone, Minerals, Sugar, Lignin, Saponins, Salicylic acids and Amino acids.

**Plant Part use:** - Leaves

**Medicinal uses:** - Anticancer, Antioxidant, Antidiabetic, and Antihyperlipidemic, Anti-inflammatory, Anti-acne effect, Wound healing, Anti-aging effect, Moisturizing Effect.

### Drug Profile

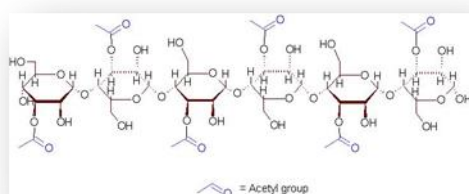


Figure 6 Structure of Acemannan

### Acemannan

**Chemical Structure:** Acemannan is a complex polysaccharide composed mainly of mannose, glucose, and galactose molecules.

**Therapeutic Class:** Biologic response modifier, wound healing agent, immunomodulator

**Mechanism of Action:**

**Wound Healing:** Acemannan promotes wound healing by stimulating fibroblast proliferation, collagen synthesis, and angiogenesis (formation of new blood vessels). It also possesses antimicrobial properties, which help prevent wound infections.

**Anti-inflammatory:** Acemannan exhibits anti-inflammatory effects by inhibiting the production of pro-inflammatory cytokines and modulating the immune response.



Figure 7 Malabar neem leaves

**Malabar Neem:** -

**Family:** - Meliaceae

**Botanical Name:** - Melia Dubia

**Synonym:** - Melia dubia Commonly known as Melia Composita Wild, Malabar Neem, Maha Neem, Gora Neem.

**Geographical Source:** -It is distributed all throughout India (with the exception of Jammu & Kashmir, Himachal Pradesh, and Sikkim).



**Morphology:** -It grows up to 6m to 30m in height, with a spreading crown and straight bole of 10m, and a tap root. It grows in a variety of soil types, such as deep fertile sandy loam and shallow gravelly soil. *Melia dubia* is drought tolerant in nature. It grows annually in a temperature of 23-43 °C

**Active Constituents:** - Cycloheximide, Cholesterol, Cety alcohol, Tridecyl trichloro acetate, Thymol, Methyl palmitate, Cyclandelate, Dibutyl phthalate, Methyl stearate, Enoxolone or glycyrrhetic acid.

**Plant Part Used:** - Leaves And Bark.

**Medicinal Uses:** -These Properties Include. Antifungal, Anti-inflammatory, Analgesic, Antimicrobial, Antioxidant

### Drug Profile

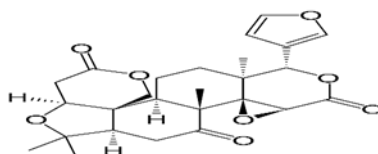


Figure 8 Structure of Limonoids

**Limonoids:** -

**Chemical Structure:** The prototypical structure consists of four six- membered rings and a furan ring. Limonoids are classed as tetranortriterpenes.

**Therapeutic class:**

**Antioxidant Activity:** Limonoids exhibit antioxidant properties, which can help protect cells from damage caused by free radicals. This antioxidant activity may contribute to their potential health benefits, including reducing the risk of chronic diseases such as cancer and cardiovascular disease.

**Anti-inflammatory Effects:** Some studies suggest that limonoids possess anti-inflammatory properties, which could make them beneficial for conditions characterized by inflammation, such as arthritis and inflammatory bowel disease.

**Antimicrobial Activity:** Limonoids have demonstrated antimicrobial activity against a range of bacteria, fungi, and viruses. This antimicrobial activity suggests their potential use in the treatment of infections caused by these pathogens.

### Extraction Of Malabar Neem Oil: (Soxhlet Extraction Method)

**Grinding:** Start by grinding the dried Malabar neem leaves into a fine powder. This increases the surface area and facilitates the extraction process.

**Packing Soxhlet Extractor:** Pack the ground plant material into the thimble of the Soxhlet extractor. Ensure that the thimble is not overly packed to allow proper solvent flow.

**Solvent Selection:** Choose a suitable solvent for oil extraction. Commonly used solvents include hexane, ethanol, or petroleum ether. The choice of solvent depends on the polarity of the desired compounds and safety considerations.

### Setup Soxhlet Apparatus:

Assemble the Soxhlet apparatus, which consists of a round-bottom flask, Soxhlet extractor, condenser, and receiving flask. Fill the round-bottom flask with the selected solvent. Connect the Soxhlet extractor to the condenser and place it on top of the round-bottom flask.

### Extraction Process:

1. Heat the round-bottom flask containing the solvent to reflux. This causes the solvent vapor to rise and pass through the condenser.
2. The hot solvent vapor condenses in the condenser and drips onto the plant material in the Soxhlet extractor.
3. The solvent dissolves the essential oil and other desired compounds from the plant material as it continuously cycles through the Soxhlet extractor.
4. As the solvent level in the Soxhlet extractor rises, it eventually siphons out of the extractor and back into the round-bottom flask due to the siphon action of the apparatus.
5. This cyclic process facilitates efficient extraction of oil from the plant material.

### Concentration of Extract:

Continue the extraction process for several hours or until the oil concentration in the solvent reaches a satisfactory level. The extracted oil is now present in the solvent in the round-bottom flask.

**Solvent Removal:**

After extraction, remove the solvent from the extracted oil using a rotary evaporator or other suitable method. This leaves behind the concentrated oil extract.

**Final Processing and Storage:** Filter the concentrated oil extract to remove any remaining plant material or impurities. Transfer the filtered oil extract into clean, airtight containers for storage. Store the oil extract in a cool, dark place to maintain its quality and stability.



**Figure 9 Malabar neem extract**  
**Figure 10 Soxhlet extraction**

**Extraction Of Curcumin: (Maceration)**

**Prepare the turmeric:** Start with fresh turmeric roots or high-quality turmeric powder. If using fresh turmeric, wash and peel the roots.

**Cut or grind:** Chop the turmeric roots into small pieces or use a grinder to create a coarse powder. This increases the surface area and aids in extraction.

**Choose a solvent:** Common solvents for curcumin extraction include alcohol (such as ethanol or isopropanol), water, or oil (such as coconut oil or olive oil). Each solvent has its own advantages and yields different types of extracts.

**Alcohol:** Alcohol is often used for its efficiency in extracting curcumin. Use food-grade alcohol and ensure it's at least 60-70% alcohol by volume.

**Water:** Water extraction is milder compared to alcohol extraction and may not yield as potent an extract, but it's a good option if you prefer an alcohol-free extract.

**Oil:** Oil extraction is suitable for creating infused oils. It's not as efficient at extracting curcumin as alcohol, but it's a good option for culinary purposes or for making topical applications.

**Combine turmeric and solvent:** Place the chopped or ground turmeric in a clean, dry glass jar or container. Pour the solvent over the turmeric until it's fully submerged.

**Mix and seal:** Gently stir the mixture to ensure all the turmeric is in contact with the solvent. Seal the jar tightly with a lid.

**Macerate:** Place the sealed jar in a cool, dark place away from direct sunlight. Let it macerate for at least a few days to several weeks, shaking the jar occasionally to agitate the mixture.

**Strain:** After the desired maceration period, strain the mixture through a fine mesh strainer or cheesecloth to separate the liquid extract from the solid turmeric residue.

**Store:** Transfer the strained extract into a clean, dark glass bottle or container. Store it in a cool, dark place, away from sunlight and heat, to preserve its potency.

**Optional: Evaporation:** If using alcohol or water as the solvent, you can evaporate some of the solvent to concentrate the extract further. Use gentle heat (such as a double boiler) to evaporate the solvent slowly, taking care not to overheat or boil the extract.

**Usage:** Use the extracted curcumin as desired, whether in cooking, as a dietary supplement, or for topical applications.





Figure 11 Turmeric extract  
Figure 12 Maceration of turmeric

#### Extraction Of Acemannan:

**Harvesting Aloe vera leaves:** The first step is to select mature Aloe vera leaves from healthy plants. The leaves are usually harvested by hand to avoid damaging the plant.

**Removing the outer skin:** After harvesting, the outer skin of the Aloe vera leaves is removed to expose the inner gel. This can be done manually or with automated machinery.

**Extracting the gel:** The gel from the inner leaf is then extracted. This can be achieved through various methods such as crushing the leaves or using mechanical or chemical methods to separate the gel from the leaf matrix.

**Purification:** Once the gel is extracted, it undergoes purification to remove impurities and other components. This can involve filtration, centrifugation, or other separation techniques.

#### Phytochemical Analysis: Malabar Neem extract for Limonoid



Figure 13 Aloe vera gel

#### Organoleptic Evaluation:

**Colour:** Malabar neem extract can vary in colour depending on factors such as the extraction method and the presence of different compounds. Limonoids themselves may impart a yellowish or orange hue to the extract due to their natural pigments.

**Odor:** Limonoids often contribute to the characteristic citrusy aroma associated with citrus fruits. While Malabar neem may not have an identical aroma, it might exhibit hints of citrus or other pleasant fragrances.

**Taste:** Limonoids can contribute to a bitter taste, although this may be masked or altered by other compounds present in the extract. The taste of Malabar neem extract may vary from bitter to astringent, depending on its composition.

**Texture:** The texture of the extract can provide information about its concentration and purity. Limonoids themselves do not have a specific texture, but a well-prepared extract should have a smooth consistency without any grittiness or particulate matter.

**Clarity:** The clarity or turbidity of the extract can indicate its purity and concentration of soluble compounds. Limonoids are soluble in organic solvents and should contribute to the overall clarity of the extract.

**Solubility:** Limonoids are typically soluble in organic solvents such as ethanol or methanol. Observing the solubility of Malabar neem extract in different solvents can provide insights into the presence of limonoids.

**Chemical test:**

Sr. No.	TEST	OBSERVATION	INFERENCE
1.	<b>Salkowski test:</b> 1ml Malabar neem extract adds in Chloroform then add few drops of Sulfuric acid to it.	Redish brown colour	Indicate presence of terpenoid or limonoid
2.	<b>Iodine test:</b> 1ml Malabar neem extract adds in Chloroform then add few drops of Iodine solution to it.	Colour complex or Precipitation	Indicate presence of terpenoid or limonoid
3.	<b>Vanillin test:</b> 1ml Malabar neem extract add Glacial Acetic acid then add Vanillin reagent to it.	Bluish green or violet colour	Indicate presence of terpenoid or limonoid

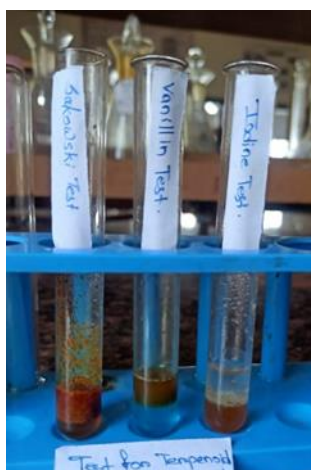


Figure 14 Chemical test for Limonoid

**Phytochemical Analysis: Turmeric Extract For Curcumin**

**Organoleptic Evaluation:**

**Colour:** Curcumin imparts a vibrant yellow-orange colour to turmeric extract. This intense hue is one of the most distinctive characteristics of turmeric and is often used as a natural food colouring agent.

**Odor:** Turmeric extract has a characteristic earthy and slightly spicy aroma, largely attributed to curcumin. The scent is often described as warm, aromatic, and somewhat bitter.

**Taste:** Curcumin contributes to the distinctively bitter and slightly pungent taste of turmeric extract. The bitterness is often accompanied by a hint of warmth and spiciness, which adds to the overall flavour profile.

**Texture:** Turmeric extract is typically a fine powder or a thick paste when concentrated. The texture can vary depending on the form of the extract (powder, liquid, or paste) and any additional processing it undergoes.

**Chemical test:**

Sr. No.	TEST	OBSERVATION	INFERENCE
1.	<b>Ferric Chloride test:</b> 1ml Turmeric extract add some amount of ferric chloride to it.	Greenish blue colour	Indicate presence of curcumin
2.	<b>HCl test:</b> 1ml Turmeric extract add few drops of HCl to it.	Pink colour	Indicate presence of curcumin
3.	<b>Boric acid test:</b> 1ml Turmeric extract add some amount of boric acid to it.	Redish brown colour	Indicate presence of curcumin
4.	<b>Sulfuric acid test:</b> 1ml turmeric extract add few drops of H <sub>2</sub> SO <sub>4</sub> to it.	Crimson colour	Indicate presence of curcumin



Figure 15 Chemical test for Curcumin

**Phytochemical Analysis: Aloe Vera Gel For Acemannan**

**Organoleptic Evaluation:**

**Odor:** Acemannan does not typically contribute significantly to the odour of Aloe vera gel. The characteristic odor of Aloe vera gel is often described as fresh, slightly herbal, and reminiscent of the plant itself.

**Taste:** Acemannan is generally tasteless, so it does not significantly impact the taste of Aloe vera gel. The taste of Aloe vera gel is often described as mildly bitter, with a slightly sour or tangy undertone.

**Colour:** Acemannan does not contribute directly to the colour of Aloe vera gel. The gel itself typically ranges from clear to slightly cloudy, with a colour that can vary from translucent green to yellowish. The colour may be influenced by factors such as the age of the plant, processing methods, and any added ingredients.

**Texture:** Acemannan contributes to the gel-like texture of Aloe vera gel. The gel is typically smooth and viscous, with a consistency that is similar to that of a thick lotion or gelatine.

**Formulation Of Herbal Cream:**

**Materials:**

Herbal crude medications are gathered from various locations and extracted on a laboratory scale for further steps. In addition, necessary components are verified and weighed in the appropriate amounts.

**Formulation table:**

Sr. No.	Ingredients	Quantity for F <sub>1</sub>	Quantity for F <sub>2</sub>
1.	Malabar neem extract	02.25 ml	02.50 ml
2.	Turmeric extract	01.50 ml	01.50 ml
3.	Aloe Vera Gel	02.25 gm	02.00 gm
4.	Liquid paraffin	15.00 ml	15.00 ml
5.	Bees Wax	04.50 gm	04.50 gm
6.	Borax	00.30 gm	00.30 gm
7.	Methylparaben	00.03 gm	00.03 gm
8.	Distilled water	03.42 ml	03.42 ml
9.	Orange oil	00.75 ml	00.75 ml

**Method:**

1. In a borosilicate glass beaker, heat the liquid paraffin and beeswax to 75 °C and keep it there (Oil phase).
2. Dissolve borax and methylparaben in distilled water in another beaker. Heat the beaker to 75 °C to dissolve the ingredients and get a transparent solution (aqueous phase).
3. Next, gradually mix the heated oily phase with this watery phase.
4. Next, add a measured amount of the Malabar Neem, Turmeric, and Aloe Vera extracts, and mix well until a creamy cream develops.
5. After that, apply a few drops of orange oil for scent.
6. Spread this cream out on the slab, stir it in a geometric pattern to include all the components and give it a smooth texture, and add a few drops of distilled water if needed.
7. This process of making cream is known as the slab technique or the impromptu approach.



**Figure 16 Formulated Cream**

### **Evaluation Of Herbal Cream:**

#### **Physical evaluation**

In this test, the cream was observed for colour, odour, texture, state.

#### **Irritancy**

Mark the area (1 cm) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy after some time and reported

#### **Wash ability**

A small amount of cream was applied on the hand and it is then washed with tap water

#### **pH**

0.5 g cream was taken and dispersed in 50 ml distilled water and then pH was measured by using digital PH meter

#### **Viscosity**

Viscosity of cream was done by using Brooke field viscometer at a temperature of 25 °C using spindle No. 63 at 2.5 RPM

#### **Phase separation**

Prepared cream was kept in a closed container at a temperature of 25-100 °C away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked

#### **Spread ability**

The spread ability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spread ability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

$$\text{Spread ability} = m \times l/t$$

Where,

**m**= Standard weight which is tied to or placed over the upper slide (30g)

**l**= length of a glass slide (5 cm)

**t**= time taken in seconds.

#### **Greasiness**

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like.

## II. Result:

### Identification test for Limonoids :(Triterpenoids)

Sr. No.	TEST	OBSERVATION	INFERENCE
1.	<b>Salkowski test:</b> 1ml Malabar neem extract adds in Chloroform then add few drops of Sulfuric acid to it.	Redish brown colour was observed.	Presence of (terpenoid) Limonoid was detected.
2.	<b>Iodine test:</b> 1ml Malabar neem extract adds in Chloroform then add few drops of Iodine solution to it.	Yellow colour Precipitate was observed.	Presence of (terpenoid) Limonoid was detected.
3.	<b>Vanillin test:</b> 1ml Malabar neem extract add Glacial Acetic acid then add Vanillin reagent to it.	Bluish green colour was observed.	Presence of (terpenoid) Limonoid was detected.

### Identification test for Curcumin :(Resin)

Sr. No.	TEST	OBSERVATION	INFERENCE
1.	<b>Ferric Chloride test:</b> 1ml Turmeric extract add some amount of ferric chloride to it.	Greenish blue colour was observed.	Presence of Curcumin (resin) was detected.
2.	<b>HCl test:</b> 1ml Turmeric extract add few drops of HCl to it.	Pink colour was observed.	Presence of Curcumin (resin) was detected.
3.	<b>Boric acid test:</b> 1ml Turmeric extract add some amount of boric acid to it.	Redish brown colour was observed.	Presence of Curcumin (resin) was detected.
4.	<b>Sulfuric acid test:</b> 1ml turmeric extract add few drops of H <sub>2</sub> SO <sub>4</sub> to it.	Crimson colour was observed.	Presence of Curcumin (resin) was detected.

### Evaluation parameter for Herbal Cream:

Sr. No.	Evaluation parameter	Result F <sub>1</sub>	F <sub>2</sub>
1.	<b>Physical evaluation</b> a. Colour b. Odour c. Texture d. State	<ul style="list-style-type: none"> <li>○ Faint yellow</li> <li>○ Mild herbal</li> <li>○ Smooth</li> <li>○ Semi-solid</li> </ul>	<ul style="list-style-type: none"> <li>○ Faint yellow</li> <li>○ Mild herbal</li> <li>○ Smooth</li> <li>○ Semi-solid</li> </ul>
2.	<b>Irritancy</b>	No adverse effect observed	No adverse effect observed
3.	<b>Wash-ability</b>	Easily washable	Easily washable
4.	<b>pH</b>	Between 6 to 7	Between 6.5 to 7
5.	<b>Spread-ability (g x cm/sec)</b>	22.8	23.9
6.	<b>Phase separation</b>	No phase separation	No phase separation
7.	<b>Greasiness</b>	Non greasy	Non greasy
8.	<b>Homogeneity</b>	Uniform distribution of extract	Uniform distribution of extract

## III. Conclusion:

Curcuma longa, Aloe barbadensis miller, and Melia Dubia were used in the development of a herbal cream that showed promise as a topical therapy for eczema. It had favourable stability and physicochemical characteristics. In vitro, it showed strong anti-inflammatory and anti-eczematous actions. These results imply that the herbal cream may be used as a safe and efficient complement to traditional eczema therapies. Additional clinical research is necessary to confirm its safety and effectiveness in human beings.

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