

A COMPREHENSIVE REVIEW ON DIFFERENT TYPES OF POLYHERBAL FORMULATION FOR PREPARATION OF FACE PACK

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ABSTRACT

The growing demand for natural and safe cosmetic products has significantly increased the interest in herbal formulations for skincare applications. Among these, polyherbal face packs have emerged as effective alternatives to synthetic cosmetics due to their multifunctional benefits, minimal side effects and eco-friendly nature. Polyherbal formulations combine two or more medicinal plants to achieve synergistic therapeutic effects, resulting in enhanced efficacy and broader skin-protective actions. This review aims to provide a comprehensive overview of different types of polyherbal formulations used in the preparation of face packs, their ingredients, methods of preparation, evaluation parameters, and therapeutic significance. Various medicinal plants such as *Azadirachta indica* (Neem), *Ocimum sanctum* (Tulsi), *Curcuma longa* (Turmeric), *Aloe barbadensis* (Aloe vera), *Hibiscus rosa-sinensis* (Hibiscus), *Rosa damascena* (Rose), *Trigonella foenum-graecum* (Fenugreek) and Multani Mitti are extensively utilized because of their antimicrobial, anti-inflammatory, antioxidant, moisturizing, exfoliating, and skin-brightening properties. The review discusses different formulation approaches including powder-based, clay-based, gel-based, cream-based, peel-off, extract-based, freeze-dried and spray-dried face packs. Important evaluation parameters such as organoleptic characteristics, pH, moisture content, ash value, particle size, bulk density, angle of repose, spreadability, washability, irritancy and stability studies are also highlighted. Polyherbal face packs offer a cost-effective, sustainable, and consumer-friendly solution for managing common skin concerns such as acne, pigmentation, dullness, excess oiliness, and premature aging. Despite their widespread acceptance, challenges related to standardization, quality control and regulatory compliance remain. Future research should focus on clinical validation, advanced delivery systems, and formulation optimization to enhance the safety, efficacy, and commercial potential of polyherbal face packs in modern cosmetology.

KEYWORDS: Polyherbal Face Pack, Herbal Cosmetics, Skin Care, Medicinal Plants, Natural Formulation, Cosmeceuticals, Herbal Dermatology, Phytoconstituents.

INTRODUCTION

Herbal medicine and cosmetology have gained remarkable importance in recent years because of the increasing demand for natural, safe, and cost-effective skincare products. The global cosmetics industry is witnessing a paradigm shift from synthetic chemical-based formulations to plant-based alternatives, primarily due to rising consumer awareness regarding the adverse effects of synthetic ingredients such as parabens, sulfates and artificial fragrances. These chemicals are often associated with skin irritation, allergic reactions, hormonal disruption and long-term dermal toxicity.

Among various herbal cosmetic preparations, polyherbal face packs are widely used for enhancing skin appearance and maintaining healthy skin. Face packs represent one of the oldest forms of topical cosmetic therapy, documented in traditional systems of medicine like Ayurveda, Unani and Siddha. Historically, ingredients such as Multani mitti (Fuller's earth), Chandan (sandalwood), Haldi (turmeric), Neem and Gulab (rose) were mixed with natural bases like milk, honey or rose water to cleanse, exfoliate and rejuvenate the skin. A polyherbal formulation refers to a preparation containing two or more medicinal herbs combined in a

suitable proportion to produce synergistic therapeutic effects. The rationale behind polyherbalism is based on the Ayurvedic principle of Samyoga, which states that combining multiple herbs enhances therapeutic efficacy, minimizes toxicity of individual components, and provides a broader spectrum of activity. These formulations are considered more effective than single-herb preparations because different herbs contribute multiple pharmacological activities such as cleansing, moisturizing, antimicrobial, anti-inflammatory, antioxidant and skin-nourishing properties. Human skin is continuously exposed to external aggressors including ultraviolet radiation, environmental pollutants, dust and microbial pathogens. These factors contribute to common dermatological concerns like acne vulgaris, hyperpigmentation, premature aging, excessive sebum secretion and xerosis. A well-designed polyherbal face pack can simultaneously address these multiple concerns: for instance, clay bases absorb excess oil and impurities, *Azadirachta indica* (neem) and *Ocimum sanctum* (tulsi) provide broad-spectrum antimicrobial action, *Curcuma longa* (turmeric) and *Glycyrrhiza glabra* (licorice) exhibit skin-brightening and anti-inflammatory effects, while *Aloe barbadensis* (aloe vera) and honey ensure hydration and barrier repair. Despite the widespread traditional use and commercial availability of polyherbal face packs, there is a need for systematic scientific documentation regarding their classification, formulation strategies, standardization techniques and evaluation parameters. Variations in herb quality, geographical source, processing methods, and lack of regulatory guidelines often lead to inconsistencies in product performance. Therefore, a comprehensive review compiling different types of polyherbal formulations, their key ingredients, preparation methods and therapeutic benefits is essential for researchers, formulators and consumers alike. This review aims to provide an extensive overview of various polyherbal formulations employed in the preparation of face packs, highlighting their traditional significance, phytochemical constituents, functional benefits and current challenges in standardization and commercial scale-up.

Overview of Herbal Cosmetics: Cosmetics are products formulated using plant-derived ingredients with minimal or no synthetic chemicals. They have been used since ancient times in traditional systems like Ayurveda, Unani and Siddha for skincare, haircare, and overall beautification. With increasing awareness of side effects from synthetic cosmetics, consumers are shifting toward natural, plant-based alternatives. Herbal face packs represent a major category in this segment due to their ability to cleanse, nourish, and rejuvenate skin without causing significant irritation.

Importance of Polyherbal Formulations: Combine two or more herbs to achieve enhanced therapeutic efficacy. The concept is based on Ayurvedic principles where multiple herbs act synergistically, targeting different pathological aspects of a condition simultaneously. In

face packs, polyherbal combinations help address multiple skin issues like acne, dullness, pigmentation and inflammation in a single formulation. They also reduce the dose of individual herbs, minimizing toxicity while improving overall effectiveness and stability.

Growing Demand for Herbal Face Packs: The global shift toward “clean beauty” and sustainable personal care has increased demand for herbal face packs. Consumers prefer products free from parabens, sulfates and artificial fragrances. Rising cases of sensitive skin, acne, and pollution-induced damage have further pushed the market toward natural solutions. Additionally, herbal face packs are cost-effective, eco-friendly, and culturally accepted, making them popular in both domestic and international cosmetic markets.

2. Concept of Polyherbal Formulation:

Polyherbal formulation refers to the use of more than one herb in a single preparation to achieve therapeutic benefits. This concept is rooted in traditional systems like Ayurveda, where combinations of herbs are used to balance doshas and enhance overall efficacy. The principle is that different phytoconstituents from multiple plants act on multiple targets in the body or skin, giving a broader spectrum of action compared to single-herb formulations.

Advantages of Polyherbal Approach

- **Enhanced Efficacy:** Combined herbs work together to produce better results than individual herbs.
- **Dose Reduction:** Lower quantity of each herb reduces chances of toxicity or side effects.
- **Multi-target Action:** Addresses several skin issues like acne, inflammation, and pigmentation simultaneously.
- **Improved Stability:** Some herbs act as natural preservatives or stabilizers for others.
- **Cost Effective:** Uses locally available herbs, reducing production cost.

Synergistic Effects of Herbal Ingredients Synergism

Synergistic Effect occurs when the combined effect of herbs is greater than the sum of their individual effects. In face packs, for example

- **Neem + Turmeric:** Neem gives antimicrobial action, Turmeric gives anti-inflammatory and skin brightening effect. Together they control acne and scars more effectively.
- **Aloe vera + Sandalwood:** Aloe vera hydrates and heals, Sandalwood soothes and reduces oiliness.
- **Multani Mitti + Rose:** Multani Mitti absorbs excess oil, Rose provides toning and fragrance.

3. Face Packs: An Overview

3.1 Definition and Purpose of Face Packs: A face pack is defined as a smooth, semi-solid cosmetic preparation intended for external application on the facial skin. It is applied in a thick layer and allowed to dry for a specific period, typically 15–20 minutes, before being washed off

with water. The primary purpose of a face pack is to cleanse, rejuvenate, and improve the overall health and appearance of facial skin. It functions by

- **Cleansing:** Adsorbing dirt, sebum and toxins from the stratum corneum.
- **Exfoliating:** Removing dead skin cells to reveal smoother, brighter skin.
- **Stimulating Circulation:** The drying and tightening action improves blood flow to facial tissues.
- **Delivering activity:** serving as a vehicle to deliver therapeutic herbal constituents directly to the skin.

3.2 Types of Face Packs: Based on their physical form and mechanism of action, face packs are broadly classified into:

- **Clay / Mud Based Face Packs:** Contain natural clays like Multani mitti Fuller's Earth, Bentonite or Kaolin. They work by adsorption and are highly effective for oily and acne-prone skin due to their oil-absorbing properties.
- **Peel-Off Face Packs:** Form a thin film on the skin after drying, which is then peeled off. They are effective for removing superficial blackheads, whiteheads and dead cells.
- **Herbal Powder Face Packs:** Composed of dried and powdered herbs mixed with a liquid base like water, milk, or rose water before application. These are customized based on skin type and are the primary focus of polyherbal formulations.
- **Cream Based Face Packs:** Emulsion or gel formulations that provide hydration along with cleansing. Suitable for dry and sensitive skin types.

3.3 Benefits of Herbal Face Packs over Synthetic Counter parts: Polyherbal face packs are gaining significant attention due to their distinct advantages

- **Minimal Side Effects:** Being composed of natural ingredients, they are generally non-irritant, non-toxic and have a lower incidence of allergic reactions compared to synthetic chemicals
- **Multi-Functional Action:** A single formulation can simultaneously provide cleansing, anti-acne, anti-aging and skin-brightening effects due to the synergistic action of multiple herbs. Eco-Friendly

and Biodegradable: Herbal constituents are sustainable, do not cause environmental pollution, and are free from harsh chemicals like parabens and sulphates

- **Cost-Effective:** The raw materials are readily available and inexpensive, making the final product economical for large-scale production and consumer use.
- **Rich in Phytoconstituents:** They naturally contain vitamins, antioxidants, tannins and essential oils that nourish the skin and prevent oxidative damage.

4. Skin Anatomy and Physiology

Skin anatomy refers to the physical structure and organization of the skin, including its various layers, cells, glands, and associate structures. Skin homeostasis and protect the body

Physiology: Skin physiology refers to the normal functions and biological processes performed by the skin to maintain.

Structure of Skin: The human skin is composed of three primary layers

1. **Epidermis:** The outermost layer, devoid of blood vessels. It consists of stratified squamous epithelium. The stratum corneum, the uppermost sublayer, is composed of dead keratinized cells and acts as the main site of action for topical face packs. The stratum basale contains melanocytes responsible for melanin synthesis.
2. **Dermis:** The middle layer, rich in connective tissue, blood vessels, and nerve endings. It houses sebaceous glands that secrete sebum, hair follicles, and sweat glands. This layer provides structural support and nutrition to the epidermis.
3. **Hypodermis / Subcutaneous Layer:** The innermost layer, composed mainly of adipose tissue. It functions as an insulator and shock absorber. It has minimal relevance to the direct action of face pack.

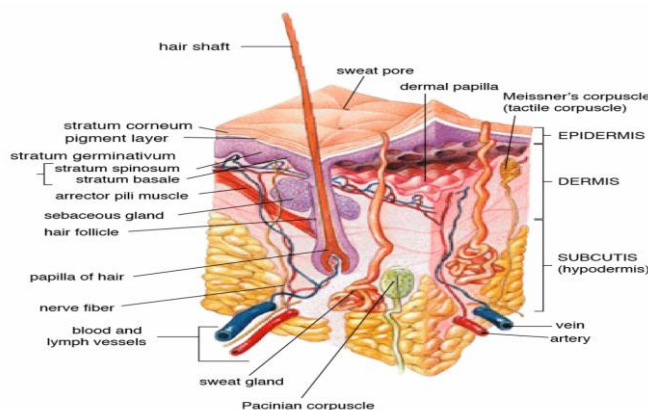


Fig.1: Structure of skin.

4.3 Functions of Skin: The skin performs several vital functions that are relevant to the application of polyherbal face packs

- A. Protection & Barrier Function:** It forms a physical and chemical barrier against environmental stressors such as UV radiation, pollutants, and pathogenic microorganisms. Herbal ingredients like Aloe barbadensis help restore this barrier.
- B. Secretion:** Sebaceous glands secrete sebum to lubricate and waterproof the skin. Dysregulation leads to oily skin and acne. Herbs like Azadirachta indica regulate sebum secretion.
- C. Pigmentation:** Melanocytes produce melanin, which determines skin color and provides photoprotection. Tyrosinase enzyme inhibitors like Glycyrrhiza glabra reduce hyperpigmentation.
- D. Excretion:** The skin aids in the elimination of metabolic wastes and dead cells through the stratum corneum. Exfoliating agents in face packs accelerate this process.

4.4 Common Skin Problems: Several dermatological conditions are commonly targeted by polyherbal face pack formulations

- a) **Acne Vulgaris:** An inflammatory condition caused by overactive sebaceous glands, follicular hyperkeratinization and bacterial colonization by Propionibacterium acnes.
- b) **Hyperpigmentation:** A condition characterized by excess melanin deposition due to UV exposure or hormonal factors, leading to tanning and dark spots.
- c) **Oily Skin:** Results from hypersecretion of sebum by sebaceous glands, leading to a greasy appearance and clogged pores.
- d) **Dry & Sensitive Skin:** Caused by impairment of the skin's barrier function, resulting in transepidermal water loss, roughness, and irritation.
- e) **Dullness:** Occurs due to the accumulation of dead corneocytes in the stratum corneum, leading to a lack of luster and uneven skin texture.

5. Ideal Characteristics of an Herbal Face Pack: A well-formulated polyherbal face pack should possess the

following ideal characteristics to ensure efficacy, safety, and consumer compliance

- **Safety and Non-Toxicity:** This is the most critical characteristic. The formulation must be dermatologically safe and non-toxic.
- **Free from Irritants:** It should not cause any erythema, edema, itching, or irritation upon application. All herbal ingredients must be selected after confirming their historical safety profile.
- **Non-Allergenic:** The herbs used should have a low sensitization potential. Patch testing should confirm absence of allergic reactions.
- **Free from Harmful Chemicals:** The formulation must be free from synthetic colors, parabens, sulfates, and heavy metals like lead and arsenic, which are often found in low-quality synthetic packs.

5.1 Stability: The face pack must remain stable throughout its shelf life under normal storage conditions.

- **Physical Stability:** No change in color, odor or texture should occur. The powder should remain free-flowing and not form lumps or cakes due to moisture absorption.
- **Chemical Stability:** The active phytoconstituents like curcuminoids in turmeric or azadirachtin in neem should not degrade. This ensures consistent therapeutic efficacy.
- **Microbiological Stability:** The formulation should resist microbial growth. Natural preservatives like neem or tulsi powder help maintain microbial safety without synthetic agents.

6. Classification of Polyherbal Face Packs:

Classification of Polyherbal Face Packs Based on Physical Form Poly herbal face packs are primarily classified based on their formulation type and vehicle used. Each type has a distinct mechanism and skin suitability.

Table 1: According to Classification Polyherbal Face Pack.

Types	Form	Method of use	Advantage	Best For	Mechanism	Example
Powder Face Pack	Dry mixture of Finely powdered herbs & clays	Mixed with Rose water, Milk Or water before use	Longest shelf Life, on Preservatives, Highly customizable	All skin types	Absorbs oil and impurities upon drying	Neem, turmeric Multani Mitti powder
Gel- Based Face pack	Semi-transparent hydrogel With herbal Extract	Ready to Apply Directly From tube	cooling effect non-grasy, intense hydration	Dry, sensitive And irritated Skin	Hydrates stratum Corneum , Delivers Water-soluble actives	Aloe vera , Cucumber extract gel Pack
Cream –based Face pack	Oil-in-water Emulsion with Herbal extract And oils	Ready to Apply, Thicker consistency	Provides Emolliency and nourishment with	Dry and Mature skin	Mositure while Removing Surface	Sandalwood Almond oil Cream pack

			cleansing		impurities	
Peel Off Face pack	Liquid/gel with Film-forming Agents like PVA + herbs	Applied as Thin layer, Off after drying	Removing Blackheads, Whiteheads, Dead cell	Oily skin, Congested Pores	Mechanism removal of keratin Keratin plug	Charcool Tea tree Peel-off Pack
Clay Based Face pack	Paste or powder containing Natural clay + Herbs	Applied as Thick Layer, Dried completely	Excellent sebum and Toxin Adsorption Capacity	Oily and Acne – Prone skin	Adsorption – Clay bind To oil, dirt And toxins	Multani mitti, Neem claypack

7. Medicinal plant commonly used for face pack

1. Fenugreek powder
2. Starch powder
3. Aloe powder
4. Coffee powder
5. Turmeric
6. Hibiscus powder
7. Rose powder
8. Red gram
9. Multani soil
10. Neem
11. Tulsi

1] METHI POWDER

Synonym: Fenugreek powder.

Biological Source: (*Trigonella foenum-graecum*) is an annual herb from the Fabaceae family with three small obovate to oblong leaves. It is grown worldwide as a semi-arid crop. Its seeds and leaves form the basis of the cuisine of the Indian subcontinent and have been used as a culinary ingredient since ancient times.

Chemical constituents: Fenugreek seeds include flavonoids, alkaloids, coumarins, vitamins, and saponins; the most prevalent alkaloid is trigonelline and coumarins include cinnamic acid and scopoletin.

Uses: Improves Skin Health, It also reduces acne, pimples and bestows a smooth and glowing skin. The natural oils present in fenugreek powder hydrates and moisturize the skin and make it supple and soft.



Fig. 2: Methi Powder.

2] STARCH POWDER

Synonym: Amylum.

Biological source: Starch consist of polysaccharide granules obtained from the grains of maize *zea mays* L. of wheat Family-Graminae.

Chemical constituent: Amylopectin, Amylose. Starch or amyum is a polymeric carbohydrate containing many sugars connected by glycosidic bonds. This polysaccharide is produced by most green plants and is used to store energy. It is the most abundant carbohydrate in the human diet worldwide and is abundant in staple foods such as rice, potatoes, maize (kernels), wheat and yams (cassava). Pure starch is a white, tasteless, odorless powder that is insoluble in cold water or alcohol. It consists of two types of molecules: linear and helical amylose and branched amylopectin. Depending on the plant, starch typically contains 20 to 25% amylose and 75 to 80% amylopectin by weight. Glycogen is the animal's energy store and is a branch of amylopectin.

Uses: Cornstarch is beneficial for acneprone skin because it absorbs excess oil from the skin, which can lead to breakouts. Using cornstarch helps remove dirt, dust, oil, grime, etc from your pores. It prevents breakage by helping to remove foreign materials.



Fig. 3: Starch Powder.

3] ALOE VERA POWDER

Synonym: Aloe.

Biological Source: Aloe is the dried latex of *Aloe Barbadensis* leaves.

Chemical Composition: Anthracene (11-40%), Isobabolin, Babolin or Aloe glycoside Aloe Vera is a succulent plant of the Aloe genus. There are nearly 500 species of aloe, classified in many ways and thought to be endemic to many parts of the world. It is an evergreen plant in the Arabian Peninsula but grows in tropical, subtropical and dry climates worldwide. It is grown for commercial products, especially cosmetics, which have been used for hundreds of years. These species are attractive for decoration and complement as House plants.^[4]

Uses 1. Relive heat

2. Moisturize the skin.
3. Promote wound healing.
4. Prevents skin aging.
5. Reduces bacteria and acne.
6. Do the spots on your face.



Fig. 4: Aloe vera Powder.

4] COFFEE POWDER

Synonyms: Coffee Powder.

Biological Source: Dried seeds of Arabica coffee.

Chemical Constituents: Caffeine, Tannins, Fats, Carbohydrates and Proteins Coffee is a beverage brewed from roasted coffee beans (the fruit of some flowering plants of the genus *Coffea*). The seeds are separated from the coffee cherries to obtain a stable product: no green coffee. The seeds are then roasted, a process that transforms them into the product: The coffee is roasted, ground to a good quality, and usually soaked in hot water before filtering to make a cup of coffee. Coffee is dark, bitter, slightly acidic and has a stimulating effect on the human body, mainly due to its caffeine content. It is one of the most popular drinks in the world and can be prepared and served in many ways (such as espresso, French press, latte or freshly brewed coffee). It's usually hot coffee, but iced or iced coffee is also available. Sugar, sugar substitutes, milk or sugar are often used to reduce bitterness or increase flavor. It can be eaten with other desserts such as coffee cake or donuts. Businesses that sell fresh coffee drinks are called cafes or coffeehouses. The two most common types of coffee are *C. Arabica* and Robusta coffee. Coffee trees are grown in more than 70 countries, primarily in America, Southeast Asia, the Indian subcontinent and the equatorial region of Africa. Brazil is the leader in coffee bean production, accounting for 35% of global production as of 2018. Coffee is an important agricultural export product for many countries.

Uses

- Reduces cellulite and dark circles.
- Reduces swelling and acne
- Exfoliation
- Rejuvenates aging skin
- Natural UV protection
- Anti-cancer
- Reduces eye puffiness
- Tightens skin
- Increases skin elasticity.



Fig. 5: Coffee Powder.

5]. TURMERIC

Synonyms: *Curcuma longa*.

Biological resources: *Curcuma longa* is a flowering plant, *Curcuma longa*, Zingiberaceae, *Curcuma* family.

Chemical Composition: Curcumin, curcumin, demethoxycurcumin. Its rhizomes are used in cooking. The plant is an annual herb native to the Indian subcontinent and Southeast Asia, requiring temperatures of 20 to 30 °C (68 to 86 °F) and annual rainfall to thrive. The rhizomes of the plant are harvested every year, some for display for the next season and some for food. The rhizome is used fresh or boiled in water and dried, then ground into a dark orange-yellow powder, it is often used as a coloring and flavoring agent in the cuisine of many Asian countries, especially in curries and dyeings, its product being curcumin., the importance of turmeric. Turmeric powder has a hot, bitter, black pepper-like taste and a ground mustard aroma. Curcumin, a yellow compound produced from the turmeric plant, is approved as a dietary supplement by the World Health Organization, the European Parliament, and the US Food and Drug Administration. Although turmeric or curcumin has long been used in Ayurvedic medicine (also known as haridra), there is no good evidence that the use of turmeric or curcumin is effective in treatment.



Fig. 6: Turmeric.

Uses

- Help brighten dark places.
- Helps heal skin wounds.
- Helps improve some aspects of the skin.
- Helps disappear scars on the skin.
- Anti-aging properties.
- Moisturizes dry skin.
- Helps heal the skin.
- Help prevent damage the environment.

6]. HIBISCUS POWDER

Synonyms: Rose Mallow.

Biological source: Hibiscus is a flowering plant of the Malvaceae family.

Chemical Constituents: Citric acid, hibiscus acid, Lascorbic acid, beta-carotene. The genus is very large

and includes hundreds of species in tropical, subtropical and tropical regions worldwide. Members of the species are known for their large, elaborate flowers and are often referred to as "mallows" or, less commonly, rose mallows. Other names include hardy hibiscus, rose of Sharon, and tropical hibiscus. The genus includes annual and perennial plants, as well as trees and small trees from hibiscus flowers is known by many names around the world and can be drunk hot or cold. The drink is known for its red color, sour taste and vitamin C content.^[9]

Uses

Hibiscus is a food rich in protein, calcium, copper, iron, magnesium, manganese, potassium, zinc, vitamins A, B6, C, E and K. Plus niacin, thiamine, riboflavin, antioxidants, alpha hydroxy acids, beta hydroxy acids, malic acid and many other compounds that are good for your skin.



Fig. 7: Hibiscus.

7]. ROSE POWDER

Synonyms: Rosettes.

Biological Source: Rose is a perennial woody flowering plant or flowers of the genus *Rosa* in the family Rosaceae.

Chemical Constituents: Rose petals, anthocyanins. There are more than three hundred species and ten thousands of species. It is a group of plants that can be straight, climbing or creeping shrubs, whose stems usually have sharp thorns, whose stems usually have sharp thorns. Its flowers vary in size and shape, are often large and showy, and range in color from white to yellow and red. The species is mostly native to Asia, with a few species found in Europe, North America and Northwest Africa. Species, varieties, and hybrids are all widely grown for their beauty and often aromatic aromas. Roses have cultural significance in many societies. Rose plants a climbers that can reach seven feet in height. The different species used to create many types of garden roses can be easily hybridized.^[10]

Uses

- The benefits of roses for the skin have been known for a long time.
- Rose powder acts as a natural moisturizer to prevent premature aging.
- Increases collagen production and helps reduce redness.
- Rose powder helps eliminate uneven skin tone and reduces sebum production.^[24]



Fig. 8: Rose Powder.

8] Red Gram

Synonyms: Pigeon pea.

Biological source: Pigeon pea (*Cajanuscajan*) is a perennial legume belonging to the Fabaceae family, native to the Old World.

Chemical Constituent: Carbohydrates, proteins, pigeon pea Asia, Southeast Asia, Africa and Latin America. The scientific name of the genus *Cajanus* and species *cajan* derives from the Malay word *katjang*, meaning legume plant, referring to the bean of the plant. The scientific name of the genus *Cajanus* and the species *cajan* derives from the Malay word *katjang*, meaning legume, referring to the bean of the plant. planted.^[11]

Uses; The nutrients in red lentils make them one of the best natural exfoliants and help remove dead skin, creaultani Soil.



Fig. 9: Red gram.

9] MULTANI SOIL

Synonyms: Bentonite Clay. Fulling Earth is a clay material that can decolorize oil or other liquids without the use of harsh chemicals. Floating soil is usually made of palygorskite (atapulgitite) or bentonite.

Chemical constituents- Monto morillonite, Kaolinite & attapulgitite.

Uses: Multani mitti or full earth is used as a natural cleanser and astringent and provides many benefits to the skin such as: Reduces oil. -Resolves acne, Evens and brightens skin tone Reduces pigmentation.



Fig. 10: Multanimitti.

10. NEEM**Botanical Name:** Azadirachta indica A Juss.**Family:** Meliaceae**Synonyms:** Margosa, Indian Lilac, Nimba, Arishta, Azad Darakht-e-Hindi**Chemical Constituents:** **Triterpenoids:** Azadirachtin, Nimbin, Nimbidin, Salannin**Flavonoids:** Quercetin, Kaempferol**Fatty Acids:** Oleic acid, Stearic acid present in neem oil**Medicinal Use in Face Pack****Antibacterial:** Eliminates Propionibacterium acnes, controls acne formation**Anti-inflammatory:** Reduces redness and swelling associated with pimples.**Oil Control:** Regulates sebaceous gland activity and controls excess sebum production.**Antifungal:** Effective against skin infections and dandruff-related scalp issues.

Fig. 11: Neem.

11. TULSI**Botanical Name:** Ocimum sanctum L. / Ocimum tenuiflorum Family: Lamiaceae / Labiatae**Synonyms:** Holy Basil, Sacred Basil, Surasa, Rehan, Vrinda**Chemical Constituents:** **Volatile Oil:** Eugenol 70%, Methyl eugenol, Carvacrol**Triterpenoids:** Ursolic acid, Oleanolic acid**Flavonoids:** Apigenin, Luteolin, Orientin**Other:** Rosmarinic acid, Ocimarin, Cirsilineol**Medicinal Use in Face Pack:** **Antimicrobial:** Inhibits both bacterial and fungal growth, prevents skin infections**Purifying:** Deeply cleanses pores and removes environmental toxins.**Antioxidant:** Neutralizes free radicals, provides anti-aging effect, reduces wrinkles.**Soothing:** Calms skin allergy, itching, and irritation.**Adaptogenic:** Repairs skin damage caused by pollution and environmental stress.

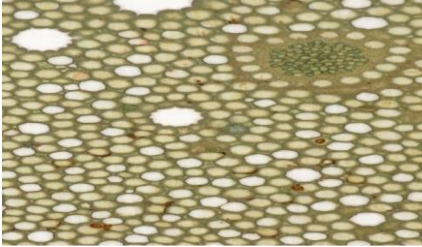


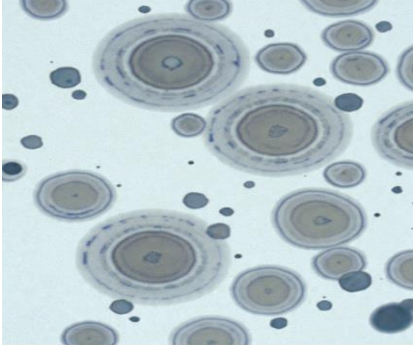
Fig. 12: Tulsi.

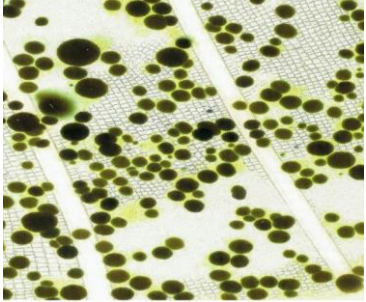

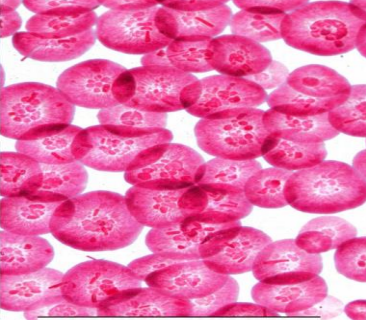
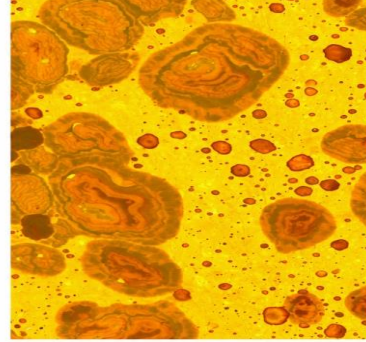
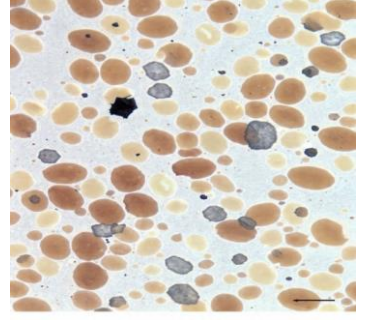
8. METHOD OF PREPARATION OF POLYHERBAL FACE PACK –**Table 2: ingredients used in polyherbal face pack.**

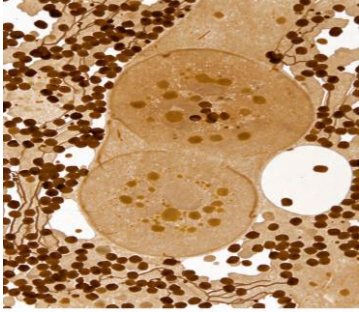

Ingredient	Botanical name	Part used
Neem	<i>Azadirachta indica</i>	Leaves / patte
Tulsi	<i>Ocimum sanctum</i>	Leaves patte
Turmeric	<i>Curcuma longa</i>	Rhizome / prakand
Methi powder	<i>Trigonella foenum-graecum</i>	Seeds
Aloevera	<i>Aloe barbadensis</i>	Leaves – dried latex / gel powder
Coffee	<i>Coffea Arabica</i>	Seeds
Hibiscus	<i>Hibiscus rosa-sinensis</i>	Flowers
Rose	<i>Rosa damascene</i>	Prtals
Red gram	<i>Lens culinaris</i>	Seeds
Multani mitti	<i>Fuller's earth</i>	Mineral clay
Starch powder	<i>Zea mays /triticum aestivum</i>	Grains

Table 3: Ingredient, quantity of polyherbal face pack^[30]

Ingredient	Quantity for 100g	purpose
Neem leaf powder	40g	Antibacterial, anti- acne
Tulsi leaf powder	30g	Antimicrobial, anti inflammatory
Multani soil	20g	Oil adsorption cleansing
Turmeric powder	5g	Antiseptic, glow
Rose powder	2g	Toning, fragrance
Hibiscus powder	5g	Natural exfoliant , anti aging
Red gram	10g	Natural exfoliant , de-tanning
Coffee powder	5g	Antioxidant , anti-cellulite
Methi powder	5g	Anti-acne ,soothes inflammation
Aloe vera	5g	Reduce irritation , hydrating
Starch powder	5g	Binding anget , oil absorption

Ingredient	Microscopic view	Microscopic undercolour /characters
Neem powder	 Neem powder	Greenish brown / anomocytic, stomata wavy epidermal cell, covering trichomes
Aloevera powder	 Aloevera powder	Pale yellow to buff mucilage cell, acicular calcium oxalate crystals
Methi powder	 Methi powder	Yellowish brown Aleurone grains, endosperm cell, oil drops
Starch powder	 Starch powder	White to – off white Simple and compound starch granules with hilum

<p>Tulsi powder</p>	 <p style="text-align: center;">Tulsi leaf powder</p>	<p>Green – brown Glandular thichomes, diacytic Stomata, oil gland</p>
<p>Rose powder</p>	 <p style="text-align: center;">Rose powder</p>	<p>Pinkish red Epidermal cell With wavy wall, Oil globules, Pollen grains</p>
<p>Hibiscus powder</p>	 <p style="text-align: center;">Hibiscus powder</p>	<p>Dark red to maroon. Pollen grains, spiral vessels, epidermal cell</p>
<p>Turmeric powder</p>	 <p style="text-align: center;">Turmeric powder</p>	<p>Bright yellow to Orange Large oval starch Grains, yellow curcumin coloured</p>
<p>Red gram</p>	 <p style="text-align: center;">Red Gram</p>	<p>Light yellow Starch grains protein bodies, Fragments of seed coat</p>

<p>Coffee powder</p>	 <p style="text-align: center;">Coffee Powder</p>	<p>Dark brown Thick walled endosperm cells, oil drops</p>
<p>Multani mitti</p>	 <p style="text-align: center;">MULTANI MITTI</p>	<p>Light gray to cream Irregular crystalline mineral particles, Amorphous masses</p>

Different formulation methods can be used for the preparation of a **polyherbal face pack** depending on the dosage form and desired characteristics of the product.

1. Dry Powder Mixing Method (Most Common)

This is the simplest and most widely used method.

PROCEDURE

- Collect, authenticate, and dry all herbal materials.
- Pulverize the dried herbs separately.
- Sieve the powders through a suitable mesh (e.g., Sieve No. 80).
- Weigh all ingredients accurately.
- Mix the powders geometrically to obtain a uniform blend.
- Pack the final powder in airtight containers.

ADVANTAGES:

- Simple and economical.
- Longer shelf life.
- Easy storage and transportation.

2. Wet Granulation Method

This method is used when better cohesiveness and uniformity of ingredients are required.

PROCEDURE

- Prepare fine powders of all herbal ingredients.
- Mix the powders uniformly.
- Add a suitable binder solution (e.g., gum acacia or starch mucilage).
- Prepare a damp mass and pass it through a sieve.
- Dry the granules in a tray dryer or hot air oven.
- Pulverize the dried granules and sieve again.
- Pack the final product.

ADVANTAGES

- Improved uniformity.
- Reduced dust formation.
- Better flow properties.

3. Herbal Extract-Based Face Pack Method

In this method, herbal extracts are used instead of crude powders.

PROCEDURE

- Prepare aqueous, hydroalcoholic, or ethanolic extracts of selected herbs.
- Concentrate the extracts.
- Mix the extracts with suitable excipients such as multani mitti, kaolin, or starch.
- Dry the mixture and convert it into powder or paste form.
- Pack in suitable containers.

ADVANTAGES

- Higher concentration of active constituents.
- Better therapeutic efficacy.

4. Paste Formulation Method

This method produces a ready-to-use face pack.

PROCEDURE

- Prepare herbal powders or extracts.
- Mix with a suitable base such as aloe vera gel, glycerin, rose water, or carbopol gel.
- Stir continuously until a smooth homogeneous paste is obtained.
- Fill into collapsible tubes or jars.

ADVANTAGES

- Convenient for consumers.
- No need for reconstitution before use.

5. Freeze-Dried (Lyophilized) Herbal Face Pack Method

A modern method used for high-quality herbal products.

PROCEDURE

- Prepare herbal extracts.
- Freeze the extract at very low temperatures.
- Remove water by lyophilization.
- Blend the dried extract with other powdered ingredients.
- Pack in moisture-proof containers.

ADVANTAGES

- Excellent stability.
- Better preservation of phytoconstituents.
- Enhanced product quality.

6. Spray-Dried Herbal Powder Method**PROCEDURE**

- Prepare herbal extracts.
- Feed the extract into a spray dryer.
- Obtain fine dried powder.
- Blend with other herbal ingredients and excipients.
- Pack appropriately.

ADVANTAGES

- Uniform particle size.
- Good flowability.
- Suitable for large-scale production.

PREPARATION OF FACE PACK**Equipment Required:**

Mortar and pestle, Sieve No. 80, Hot air oven, Glass beakers, Weighing balance, Spatula, Amber-colored container.

PROCEDURE**Step 1****Collection and Authentication**

All crude drugs are collected from authorized sources and authenticated by a botanist. Foreign matter is removed manually.

Step 2**Drying**

Neem and Tulsi leaves are shade-dried for 7 days until a constant weight is achieved. The dried material is further dried in a hot air oven at 40°C for 30 minutes to remove residual moisture.+

Step 3**Size Reduction**

The dried herbs are separately ground into a coarse powder using a mechanical grinder and then pulverized using a mortar and pestle to obtain a fine powder.

Step 4**Sieving**

All powdered ingredients are individually passed through Sieve No. 80 to obtain a uniform particle size. This ensures a smooth texture and better skin feel.

Step 5**Mixing**

Weighed quantities of all ingredients are taken as per the formula. The ingredients are mixed geometrically in ascending order of weight in a mortar to ensure uniform distribution of all components.

Step 6**Packing and Storage**

The final polyherbal face pack powder is packed in a self-sealing, moisture-free, amber-colored glass container to protect it from light and moisture. It is stored in a cool and dry place.

Directions for Use

Take 2 tablespoons of powder and make a smooth paste with rose water or plain water. Apply evenly on the face and neck. Leave for 15–20 minutes until semi-dry. Rinse with lukewarm water. Use 2–3 times per week.

Precautions during Preparation

1. Aseptic conditions are maintained to avoid microbial contamination.
2. Metallic containers are avoided during mixing to prevent reactions with herbal ingredients.
3. Moisture content is maintained below 5% to increase shelf life.
4. Particle size is kept uniform to prevent grittiness and skin irritation.

Evaluation Parameters of Polyherbal Face Pack

The prepared polyherbal face pack is evaluated for various physicochemical and performance parameters to ensure its quality, stability and efficacy.

Organoleptic Evaluation

The formulation is evaluated manually for organoleptic properties. The color is light greenish-brown, which is characteristic of the herbs used. The odor is pleasant and herbal in nature. The texture of the powder is fine, smooth, and free from grittiness. The appearance is homogeneous and free from lumps or foreign particles.

Physicochemical Evaluation

- The pH of a 1% aqueous solution is determined using a digital pH meter and is found to be in the range of 5.5–6.5, which is compatible with skin pH and helps prevent irritation.
- Moisture content is determined by the loss-on-drying method at 105°C and is found to be not more than 5%, which prevents microbial growth and increases shelf life.
- Ash value is determined by incineration at 450°C. The total ash is not more than 12%, and the acid-

insoluble ash is not more than 4%, indicating purity and the absence of inorganic matter.

- Particle size is evaluated using Sieve Nos. 80 and 120. One hundred percent of the powder passes through Sieve No. 80, and more than 90% passes through Sieve No. 120, ensuring a smooth feel and preventing skin abrasion.
- Bulk density is determined by the graduated cylinder method and is found to be between 0.3 and 0.6 g/ml, indicating good packing properties.
- Angle of repose is measured by the funnel method and is found to be between 25° and 35°, indicating good flow properties of the powder.

Preformulation Evaluation

- The spreadability test is performed by placing the paste between two glass slides with a 100 g weight for 5 minutes. The diameter of spread is found to be 5–7 cm, indicating good spreadability and easy uniform application.
- The washability test is performed by applying the pack on the skin for 15 minutes and then washing it with water. The formulation is found to be easily washable without leaving any stain, ensuring good consumer compliance.
- The grittiness test is performed by rubbing the paste between the fingers. No gritty particles are felt, confirming that the fine particles prevent skin irritation.
- The irritancy (patch) test is conducted by applying the paste on the inner forearm for 30 minutes and observing it for 24 hours. No redness, edema, inflammation, or irritation is observed, confirming that the formulation is safe for facial use.
- The foaming test is performed by shaking 1 g of powder with 10 ml of water. No significant foam is formed, confirming the absence of synthetic surfactants.
- **Stability Study**
The formulation is stored in an amber-colored glass container at 40°C ± 2°C and 75% relative humidity for one month. No changes are observed in color, odor, texture, pH, or spreadability, indicating that the formulation remains physically and chemically stable.
- **Bulk Density**
Bulk density is defined as the ratio of the mass of an untapped powder sample to its bulk volume, including the contribution of interparticulate void volume. It is expressed in grams per milliliter (g/ml) or grams per cubic centimeter (g/cm³).
- **Significance in Polyherbal Face Pack**
Bulk density is an important parameter for herbal powders because it determines the packing, handling, and filling properties of the formulation. It helps in selecting the appropriate container size for the face pack. A powder with very low bulk density occupies more volume and may create packaging

difficulties. It also affects the flow property and compressibility of the powder blend.

➤ Method of Determination

Bulk density is determined by the graduated cylinder method. Approximately 25 g of powder is weighed and gently poured into a 100 ml graduated measuring cylinder without compacting. The powder is leveled carefully without tapping, and the apparent volume is recorded. Bulk density is calculated using the following formula:

➤ Tapped Density

Tapped density is also determined to better understand powder flow properties. The cylinder containing the powder is tapped mechanically or manually for 500 taps and then for an additional 750 taps until the difference between successive volumes is less than 2%. The final tapped volume is recorded.

Angle of Repose

Angle of repose is defined as the maximum angle formed between the surface of a pile of powder and the horizontal plane. It directly indicates the flow properties of the powder and is related to interparticulate friction or resistance to movement between particles.

Significance in Polyherbal Face Pack

Determination of the angle of repose is essential because it directly affects the manufacturing process and consumer use. A powder with good flow properties flows uniformly from the container, mixes easily with water to form a smooth paste, and does not cause blockage during filling. Poor flow properties indicate a cohesive nature of the powder, which may lead to formulation difficulties.

Method of Determination (Funnel Method)

In the funnel method, a glass funnel is fixed at a height of 2–4 cm above a horizontal surface. A graph paper is placed below the funnel. The powder mixture is allowed to flow freely through the funnel until the apex of the conical pile just touches the tip of the funnel. The height and radius of the powder cone are measured. The angle of repose is calculated.

CONCLUSION

Polyherbal face packs represent a promising and effective approach in herbal cosmetology, combining the therapeutic benefits of multiple medicinal plants to promote healthy and radiant skin. The synergistic action of herbal ingredients such as neem, tulsi, turmeric, aloe vera, hibiscus, rose, fenugreek, coffee, red gram, and multani mitti provides a broad spectrum of activities including cleansing, exfoliating, antimicrobial, anti-inflammatory, antioxidant, moisturizing, and skin-brightening effects. Compared with synthetic cosmetic products, polyherbal formulations offer better safety, reduced adverse effects, eco-friendliness, and cost-effectiveness. The review highlights various formulation approaches including powder-based, gel-based, cream-based, clay-based, peel-off, extract-based, freeze-dried, and spray-dried face packs. Proper selection of

ingredients, standardization of raw materials, and evaluation of physicochemical and performance parameters are essential to ensure product quality, stability, and efficacy. The prepared polyherbal face pack demonstrates desirable organoleptic characteristics, acceptable physicochemical properties, good spreadability, washability, and stability, indicating its suitability for topical application.

With increasing consumer preference for natural and sustainable skincare products, polyherbal face packs have gained significant commercial and therapeutic importance. Future research should focus on advanced delivery systems, clinical validation, quality control measures and regulatory standardization to enhance the efficacy and global acceptance of herbal cosmetic formulations. Thus, polyherbal face packs can be considered a safe, effective, economical, and environmentally friendly alternative to conventional synthetic skincare products.

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