



## Research Article

# Formulation And Evaluation of Red Lentils Herbal Face Scrub

Akanksha Rayate, Prapti Vikhe, Kiran Kekane\*, Tejashri Mulay

Pravara Rural Education Society, College of Pharmacy for Women, Chincholi, Nashik (422103), Maharashtra, India

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### ABSTRACT

The main objective of the present study was to formulate a poly-herbal facial scrub with the incorporation of *Red Lentils* (Masoor Dal) as the main active ingredient. Cosmetics are the products used for the purpose of cleaning, beautifying, enhancing attractiveness, or changing the appearance. Plant-based cosmeceuticals usually contain some of the plants with antibacterial, antioxidant, and anti-aging properties. Herbal cosmetics are the safest everyday products with no side effects, and cosmeceuticals are products that affect the biological function of the skin. The use of natural constituents to act potentially against wrinkles, acne and they also helps in control of secretion of oil from the skin open pores that is why they are the part of herbal cosmetics. The majority of times, the skin on the face is in regular contact with dirt, pollution and other contaminants. Scrub comprises various natural components that are safe to use, have fewer adverse effects, and having antibacterial, Anti-infective, Anti-aging properties. In this formulation of facial scrub Masoor Dal, orange peel, rice flour, Multani mitti, sandal wood, Neem, Tulsi, Fenugreek, turmeric, coffee, Almond oil used as active ingredients. In this study, various herbal powders were used to formulate herbal face scrubs and evaluated with parameters such as colour, odour, pH, irritability, Washability, particle size.

### INTRODUCTION

Since ancient times, plants have been used as herbal medicines. Ayurveda has a 5000 years old heritage of plant-based medicines for human use. In the last few years, there has been remarkable growth in use of herbal plants as medicines and cosmetics. Cosmetics are used to improve skin tone, texture, cleansing reducing wrinkles, fighting

oil, acne, blackheads, pimples, and dark circles. According to Ayurveda, impurities present in blood are major cause of skin problems [7]. Face scrubs are the cosmetic formulations, that contains tiny exfoliating particles. By eliminating superficial dead cells and encouraging the development of cells in the sub-epidermal layer,

\*Corresponding Author: Kiran Kekane

Address: Pravara Rural Education Society, College of Pharmacy for Women, Chincholi, Nashik (422103), Maharashtra, India

Email ✉: [kirankekane1@gmail.com](mailto:kirankekane1@gmail.com)

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herbal exfoliating scrub reduces age-related changes and neutralizes the environment's damage [3]. It keeps face free from dirt, grime, and oils which are also beneficial in keeping the skin pores clean.

#### **Benefits of scrubbing skin:**

1. Removes dead skin cells: Dead skin makes skin look old and dull, so it is essential to get rid of those dead skin cells using mild scrub.
2. Frees Skin from Flakes: Dry spots are caused by irritated skin. It allows for the accumulation of dead cells over time. Scrubbing the face can assist in dealing with irritated skin efficiently.
3. Removes Acne Scars: Exfoliation helps in doing away with acne scars.
4. Prevents Ingrown Hair: Problem of ingrown hair in the skin due to lack of exfoliation can be solved using gentle scrub.
5. For smooth skin: Smooth skin is the key to beautiful face. Therefore, texture of the skin is maintained using mild face scrub.
6. Skin exfoliation adds glow to face and regains original beauty of skin.
7. Skin exfoliation adds glow to face and regains original beauty of skin.

### **MATERIALS & METHOD**

#### **Ingredients used**

##### **1. Red Lentils**

Kingdom: Plantae

Order: Fabales

Family: Leguminosae

Genus: *Lens*

Species: *L. culinaris*

Binomial name: *Lens culinaris*

Phytochemicals: Phenolic Acid, Phytic Acid, Flavonoids, Saponins

#### **Benefits for skin:**

- a) It acts as skin Cleanser: Masoor Dal is enriched in various nutrients such as Proteins, minerals and vitamins. It acts as excellent skin cleanser and removes all dirt from the skin.

Masoor Dal acts as excellent exfoliant when applied to skin. Masoor Dal cleansers are natural and they are not harsh on skin.

- b) Remedy to get rid of Acne: Masoor Dal serves as an excellent anti-acne solution. Not only does it remove dirt and impurities from the skin but also cleanses clogged pores and diminishes formation of acne. It also deals with blackheads, whiteheads, without removing natural moisture and structure of skin.
- c) Treatment for aging: Masoor Dal is healthy moisturizer and it strengthens the skin and helps to remove wrinkles and fine lines. It is gentle and natural remedy for aging.

##### **2. Orange Peel**

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliophyta

Subclass: Rosidae

Order: Sapindales

Family: Rutaceae

Genus: *Citrus*

Species: *sinensis*

Binomial name: *Citrus Sinensis*

Phytochemicals: Flavonoids, terpenoids, quinolines.

#### **Benefits for skin:**

Orange fruit is the best source of Vitamin C, which is useful for wellbeing and healthy skin. The health advantages of orange fundamental oil can be ascribed to its properties as an antispasmodic, antiseptic, anti-inflammatory, antidepressant, narcotic, carminative, tonic and diuretic. Essential orange oil is germicidal and anti-inflammatory.

It also has antiaging properties. When applied to skin, it also works as a toner, removing dead skin and dirt and tightening pores. Being a phenomenal source of Vitamin C, oranges are extremely useful for skin. The enzymes present in the orange peel remove dead epithelial cells and cleanse the skin deeply.



The rubbing action helps to accelerate renewal of natural cell making the skin fresher and more youthful looking. Orange peel powder helps in reduction of dark spots and blemishes. Orange peels are a natural bleaching agent that helps to reduce dark patches on the skin and viably expel them with time. [8]

### 3. Rice Flour

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Monocots

Clade: Commelinids

Order: Poales

Family: Poaceae

Genus: *Oryza*

Species: *O. sativa*

Binomial name: *Oryza sativa*

Phytochemicals: Dietary fibres, vitamins, Phenolic Compounds

#### Benefits for skin:

Rice powder has been used for centuries as a natural beauty aid by women. It's natural antiageing and oil-absorbing properties, makes them good for oily or acne-prone and dull mature skin. It's also a good anti-inflammatory and skin whitening agent that soothes sunburned skin and makes skin smooth and fairer naturally. One of the best beauty uses of rice powder that it can be used as oil absorbing natural face powder. it blends easily with the skin and cover pores. [9]

### 4. Multani mitti

Botanical name: Bentonite Clay

#### Benefits for skin:

Multani mitti which helps to remove the impurities in the form of dead skin cells. It helps to make the skin radiant. It has been proven best for the irritation-prone skin. Its soothing action calms the skin, cures the inflammation caused due to elevated phlogistic agents. It is perfect for oily skin. It removes the dirt and excess of oil by acting

as a perfect adsorbent. It provides fresh, radiant and glowing skin.

### 5. Sandal Wood

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Order: Santalales

Family: Santalaceae

Genus: *Santalum*

Species: *S. album*

Binomial name: *Santalum album L.*

#### Benefits for skin:

Sandalwood has numerous valuable qualities for uplifting skin health and beauty. It attributes to possess potent anti-inflammatory, antimicrobial, antiseptic and wound healing properties. Sandalwood extract treats several skin ailments such as scarring, wrinkles, inflammation, acne and even skin tone. Sandalwood oil supports to nourish the skin, enhance elasticity, even out texture and reduces scars and pigmentation. Antioxidants help to maintain the resilience and structure of the skin cells. It also restores moisture in the skin. The soothing and calming activities of sandalwood oil act as a natural cure for prickly heat.

### 6. Neem

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Sapindales

Family: Meliaceae

Genus: *Azadirachta*

Species: *A. indica*

Binomial name: *Azadirachta indica*

#### Benefits for skin:

Acne: Antibacterial action of *A. indica* oil was demonstrated in vitro against pathogenic bacteria by inhibiting bacterial cell membrane synthesis. *A. indica* contained nimboldid (antibacterial), gedunin

(antifungal), mahmoodin (antibacterial), margolone (antibacterial) and cyclic trisulphide (antifungal).

Anti-aging: *A. indica* stimulated collagen production, promoted soft and supple skin, aided in reducing old scars and supported healing.

Health and personal care products: *A. indica* could be used for nail care (nail oils and polish), hair care (hair oils and shampoo), oral hygiene (toothpaste and Neem twigs), skin cleanser, soaps and insect repellent (spray and lotion).

Skin disorders: *A. indica* could treat lice and scabies. Neem in a paste combination with Curcuma longa treated scabies and 97% of the volunteers were cured after application (3 to 15 days) with no adverse effects. Neem was used for diabetic foot, dry psoriasis and wounds.

Skin-whitening: *A. indica* inhibited 47% of tyrosinase with no anti-wrinkle effect, with it being best for young skin.

Wound healing: the presence of tannins could favor the healing of wounds.

## 7. Tulsi

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Asterids

Order: Lamiales

Family: Lamiaceae

Genus: *Ocimum*

Species: *O. tenuiflorum*

Binomial name: *Ocimum tenuiflorum*

### Benefits for skin:

Antioxidant: Polyphenol Rosmarinic acid present in the Tulsi. chemical composition acts as the powerful antioxidant. It protects the cells in the body from smash up due to the presence of free radicals. Excess of oxidation in the body also causes the cell damage. this acid prevents the formation of excess oxidation. (Simoons and Frederick 1998).

Antibacterial: Carvacrol and terpene are the antibacterial agents present in this remarkable plant. Sesquiterpene B-caryophyllene also serves the same purpose. This constituent is FDA approved food additive which is naturally present in Tulsi. It helps keeping the body safe from bacterium that causes illness.

Anti-inflammatory: Rosmarinic acid also is a good source of anti-inflammatory along with being an antioxidant. Pegenin is one more compound available in the composition serving the same function. Apart from these two, the most important anti-inflammatory driving force in Tulsi is 'eugenol'

Adaptogenic: Tulsi is ideal source of adaptogenic properties that controls the frequent mood swings and provide the mental peace and clarity. Eugenol and caryophyllene are the most imperative adaptogen agents present in the chemical formula of Tulsi. These are very effective in lowering the corticosterone levels that are main cause of stress. It also enhances the memory and minimizes the risk of mental problems that occur due to growing age. Ursolic acid and oleanolic acid also perform the same function of adaptogen and are very effectual in dropping the stress levels (Gavin 2001).

Immuno-modulator: It is very vital to have some immuno-modulator in the body that stabilizes, recovers and maintains the proper balanced functioning of the immune system Tulsi possess excellent immune enhancing properties that prepare the body against foreign elements like bacteria, viruses, microbes, allergens etc. Thus, it maintains the overall balance in the body.[11]

## 8. Fenugreek

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Fabales



Family: Fabaceae

Genus: *Trigonella*

Species: *T. foenum- gracecum*

Binomial name: *Trigonella foenum- gracecum*

**Benefits for skin:**

Antidote For Skin Problems: Fenugreek seeds prove to be an excellent beauty product. They help prevent wrinkles, blackheads, pimples, dryness and rashes.

Good For Beauty & Health: Fenugreek helps attain hormonal balance in women and therefore, helps in enlargement of breasts. It helps increase the lactation in breast feeding women. [12]

### 9. Turmeric

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: monocots

Clade: Commelinids

Order: Zingiberales

Family: Zingiberaceae

Genus: *Curcuma*

Species: *C. longa*

Binomial name: *Curcuma longa*

**Benefits for skin:**

Curcumin application may have an inhibitory effect on chemical carcinogenesis of the skin.

Curcumin accelerated wound healing is attributed to its antioxidant properties. It increases granulation tissue, neovascularization and enhances synthesis of extracellular matrix components including collagen. Curcumin may be a promising antifungal against *Candida*. It may also have potential as an antimicrobial, antiparasitic and antiviral agent.

Inflammation is incredibly important. It helps fight foreign invaders and has a role in repairing damage in your body.

### 10. Coffee

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Asterids

Order: Gentianales

Family: Rubiaceae

Tribe: *Coffeae*

Genus: *Coffea L.*

Binomial name: *Coffea arabica L.*

**Benefits for skin:**

Skin aging is the result of a loss of cellular function, gradual loss of the homeostatic mechanism, and disruption in the structure of skin tissues. These mechanisms are directly linked to skin aging phenotypes: wrinkle formation, uneven pigmentation and decreased wound healing.

Prevent skin ageing: Coffee is high in antioxidants such as phenols, which help fight free radicals and protect the skin from damage. As a result, fine lines, wrinkles, and saggy skin can be avoided. In fact, the antioxidants in coffee can help fight acne, increase collagen formation, and minimize hyperpigmentation.

Reduce dark circle: Coffee is also known for its ability to moisturize, heal, and strengthen skin tonality. It is, in fact, an instant remedy for puffy eyes and is great for treating dark circles.

Reduces skin inflammation: Coffee scrubs reduce stretch marks and cellulite temporarily and give skin a smoother appearance.

Excellent exfoliator: Coffee is a wonderful face scrub since it exfoliates the skin. It gently exfoliates the skin cells and removes impurities, leaving the skin smooth and refreshed. Moreover, it can help enhance the look of cellulite and tighten your skin. It will also calm your skin's redness and reduce inflammation of the skin. It is used as an eye mask for puffy eyes. It can help you to reduce inflammation of the skin.

### 11. Almond Oil

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots



Clade: Rosids

Order: Rosales

Family: Rosaceae

Genus: *Prunus*

Species: *P. amygdalus*

Binomial name: *Prunus amygdalus*

**Benefits for skin:** Almond oil is beneficial for skin. Almond oil seemingly reduces hypertrophic scarring post-operatively, smooths and rejuvenates skin. Almond oil has emollient and sclerosant properties and, therefore, has been used to improve complexion and skin tone.

### OBJECTIVES

To remove Acne and blemishes and add moisture to the skin.

- Gets rid of the problem of dry skin while also providing the skin with much needed nourishment.

- To remove dead cells that can clog your pores.
- It helps in exfoliating your skin.
- To prevents Ingrown Hair.
- Improves the texture of skin.
- provides Smoother skin.

### Method of Preparation of Herbal Face scrub:

1. Exact amount of all dry ingredients was weighed properly.
2. All the ingredients such as Masoor Dal, Orange Peel, Rice Flour, Multani Mitti, Sandalwood, Neem, Tulsi, Fenugreek, Turmeric, Coffee were taken in the mortar and were mixed together.
3. Few drops of Almond Oil was then added and mixed properly to avoid lumps.
4. Final product was enclosed in air tight container for evaluation.

**Table 1. Ingredients Used for Herbal Face scrub**

Sr. No.	Name of Ingredient	Quantity (For 20gm)	Use
1.	Masoor Dal ( <i>Red Lentils</i> )	5 gm	Excellent skin cleanser
2.	Orange Peel ( <i>Citrus Sinensis</i> )	4 gm	Removes tan and promotes youthful skin
3.	Rice Flour ( <i>Oryza Sativa</i> )	2 gm	Removes blackheads, excess oil and sebum from skin
4.	Multani Mitti	2 gm	Improves blood circulation in skin, cleaning of excess oil and dust particles
5.	Sandalwood ( <i>Santalum Album L.</i> )	1 gm	Smoothing, gives cooling effect, effective for dry skin and wrinkles
6.	Neem ( <i>Azadirachta Indica</i> )	1 gm	Treats many skin conditions, antiseptic and antiaging properties
7.	Tulsi ( <i>Ocimum Sanctum</i> )	1 gm	Prevention of acne, antimicrobial and prevents skin inflammation
8.	Fenugreek ( <i>Trigonella Foenum-Graecum</i> )	1 gm	Prevention of acne and acts as anti-inflammatory
9.	Turmeric ( <i>Curcuma Longa</i> )	2 gm	Acts as antiseptic, removes pigmentation and prevent aging
10.	Coffee ( <i>Coffea Arabica</i> )	1 gm	Antioxidants protects skin from damage, fine lines, wrinkles and saggy skin can be avoided
11.	Almond Oil ( <i>Prunus Amygdalus</i> )	Q. S	Nutritive and emollient



**Figure 1. Ingredients Used for Herbal Face scrub**

Ash value are helpful in determining the quality, and purity of crude drugs in powder form. The objective of ash value is to remove all traces of organic matter, which may interfere in analytical determination.

### **EVALUATION PARAMETERS**

#### **A) Phytochemical tests:**

##### **1. Alkaloids:**

Hager's Test: sample is mixed with 1 ml water and Hager's reagent is added. It gives yellow precipitate.

2. **Tannins:** sample is mixed with 1 ml water and 2 ml of 5%  $FeCl_3$  solution is added. It gives greenish black precipitate.

3. **Flavonoids:** sample is mixed with 1 ml water and Few drops of NaOH solution is added. It gives intense yellow colour.

4. **Phenolics:** sample is mixed with 1 ml water and 1-2 drops of  $FeCl_3$  solution is added. It gives green colour.

5. **Steroids:** sample is mixed with 1 ml water and 2ml chloroform and 2ml Concentrated  $H_2SO_4$  solution is added. It gives red colour in lower chloroform layer.

#### **B) Organoleptic Properties:**

1. Nature: nature of the scrub was evaluated manually.

2. Colour: The colour of the face scrub was checked visually.

3. Odour: The formulation was evaluated for its odour by smelling it.

4. Texture: Texture of the scrub was determined.

#### **C) Physiochemical Evaluation:**

1. pH: pH of the prepared scrub was evaluated. Small amount of the gel was applied on the pH paper.

2. Ash value: Ash value are helpful in determining the quality, and purity of crude drugs in powde form. The objective of ash value is to remove all traces of organic matter, which may interfere in analytical determination.

3. Moisture Content: Moisture content is the quantity of water contained in the material. Moisture content is a reference to the amount of moisture present in a material. This value is often represented as a percentage of the material's mass (such as X% MC). The amount of moisture in an object can be measured in several different ways, such as with oven-dry tests or moisture meters.

#### **D) General Powder Characteristics**

1. Tapped Density: Tapped density of a powder is the ratio of the mass of the powder to the

volume occupied by the powder after it has been tapped for a defined period of time.

Tapped Density: Mass/ Tapped Volume

2. Bulk Density: Bulk density is defined as the mass of the many particles of the material divided by the total volume they occupy. The total volume includes particle volume, inter-particle void volume, and internal pore volume.

Bulk Density: Mass/ Bulk Volume

3. Angle of Repose: The angle of repose is a parameter commonly used for the evaluation of interparticle force. The simplest method for the determination of the angle of repose is the “poured” angle.

Angle of Repose ( $\theta$ ):  $\tan^{-1}(2h/d)$

$\theta$  = Angle of Repose

D= Diameter in cm

H= Height in cm

4. Hausner Ratio: The Hausner ratio is an indirect measure of the property of a bulk material to reduce its volume under mechanical influence. It is also a measure of the ability to compress and of the interaction between the particles.

Hausner Ratio: Tapped Density/ Bulk Density

5. Carr’s Index: The Carr’s index an indicator of the compressibility of a powder. It is named after the scientist Ralph J. Carr, Jr. The Carr index is frequently used in pharmaceuticals as an indication of the compressibility of a powder.

Carr’s Index: (Tapped Density-Bulk Density/ Tapped Density) x 100

6. Flow Characteristics: Powder flow, also known as flowability, is defined as the relative movement of a bulk of particles among neighboring particles or along the container wall surface. In other words, powder flowability refers to the ability of a powder to flow in a desired manner in a specific piece of equipment.
7. Grittiness: The product was checked for the presence of any gritty particles by applying it on the skin.
8. Washability: Formulations were applied on the skin easily removed by washing with water were checked manually.
9. Skin irritation: Small amount of the scrub was applied on the skin and kept for few minutes and found to be non-irritant.

## RESULTS AND DISCUSSION

**Table 1. Phytochemical tests**

Sr. No.	Phytochemicals	Test	Observation	Results
1	Alkaloids	Hager’s Test: sample + 1 ml water + Hager’s reagent	Yellow precipitate	Alkaloid present
2	Tannins	Sample + 1 ml water + 2ml 5% FeCl <sub>3</sub>	Greenish black ppt	Tannins present
3	Flavonoids	Sample + 1 ml water + few drops of NaOH solution	Intense yellow colour	Flavonoids present
4	Phenolics	sample + 1 ml water + 1-2 drops of FeCl <sub>3</sub>	Green colour	Phenolics present
5	Steroids	sample + 1 ml water + 2ml chloroform + 2ml conc. H <sub>2</sub> SO <sub>4</sub>	Red colour in lower chloroform layer	Steroids present







**Figure 2. Phytochemical test**

**Table 2. Evaluation Tests**

Sr. No.	Parameters	Observations	
1.	Organoleptic Properties	Nature	Powder
		Colour	Greenish brown
		Odour	Pleasant
		Texture	Slightly gritty
2.	Physiochemical Evaluation	pH	6.5
		Ash Value	22.2% w/w
		Moisture Content	0.8% w/w
3.	General Powder Characteristics	Tapped Density	0.6gm/ml
		Bulk Density	0.5gm/ml
		Angle of Repose	27.02°
		Hausner Ratio	1.2
		Carr's Index	16.6%
		Flow Characteristics	Fair
		Washability	Easily washable
		Skin Irritation	Not observed

## SUMMARY AND CONCLUSION

In the current study herbal face scrub was formulated, evaluated for various parameters. Herbal face scrubs are used to remove dead skin cells, acne scars, prevents in grown hairs, removes dirt from skin pores, protects the skin against premature aging and promote blood circulation. Herbal face scrub has several benefits such as, nontoxic and reduces allergic reactions. This face scrub is economical, useful, in addition satisfied all of the characterization criteria. In this, all natural ingredients were used, so that they had no side effects. After testing, we discovered that the face scrub had good characteristics, was free of skin irritation, and kept their consistency even after being stored in stable settings. Also, it has the ability to provide effective bright, healthy, and

crystal-clear skin. The face scrub is beneficial, economical & passed all evaluation parameter.

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