



# FORMULATION AND EVALUATION OF HERBAL SCRUB IN GEL FORM USING TURMERIC POWDER AND LIMONIA ACIDISSIMA FRUIT OUTER SHELL POWDER

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## ABSTRACT

The main objective of the present study was to prepare a Multi-Purpose Herbal scrub incorporated into the gel. In daily life for both women and men apply the cosmetics for beautifying and altering the appearance of the skin. Nowadays consumers well aware of the product benefits and their side effects, hence the usage of the herbal cosmetics gets increases because herbal cosmetics have fewer or no side effects. L. acidissima is a huge source of vitamin C and it contains 4 times vitamin C than any other citrus fruits. Vitamins C help in Immunity improvement and also protect against common infections and pathogen. L. acidissima contains anti-oxidant like B-carotene which helps defend the skin from Aging and wrinkles. It also contains vitamin A, B helps in getting cleared of skin discoloration, dark circles, redness, and acne irritation. It is understood that the regular use on the skin helps to keep skin cool, smooth, fair and well-textured appearance it is also known to be defensive against skin cancer by blocking UV rays. The outer shell of L.acidissima, to eliminate minor spots and lesions on the skin. Turmeric powder is a powerhouse of antioxidants, flavonoids and vitamin C and A, turmeric prevents formation of free radicals. Reduced skin irritation and inflammation with turmeric face packs. It also is a great ingredient to lighten skin tone and reduce dark spots and pigmentation naturally.

Keywords: Anti-ageing, Anti-wrinkles, Anti-oxidant, herbal facial scrub, Skin Exfoliating

## AIM

Formulation and Evaluation of Multi-purpose Herbal Scrub in Gel Form using Turmeric powder and Limonia acidissima fruit outer shell powder.

## OBJECTIVE

- To Prepare a Multipurpose Scrub Incorporated into gel.
- To Study the role of Limonia acidissima fruit outer shell to prevent wrinkling or removing dirt, oil. Sebum and reduce the clogged of pore.
- To assess the efficacy & tolerability of face gel to improve the appearance of aging, wrinkle, etc.
- To nourish and beautify the skin
- Turmeric has anti-inflammatory, antimicrobial and antioxidant properties that help to manage several skin issues like signs of aging, pigmentation, acne

## INTRODUCTION

Cosmetics are used universally to enhance beauty and are available in different forms. Various types of skin ailments are formulated like skin protective, sunscreen, anti-acne, anti-wrinkle for beautifying skin. From ancient era people use herbs or herbal cosmetics for cleansing, beautifying, fighting oil, acne, blackheads, pimples, and dark circles. According to Ayurveda, impurities present in blood are major cause of skin problems.

Face scrubs are the cosmetic formulations, generally a cream or gel that contains tiny exfoliating particles. Face scrubs exfoliate and stimulate blood circulation and promotes skin turnover by removing dead skin cells and adherent cells in the stratum corneum. face scrub cleanses the skin, removes dirt, grime and oil from pores, maintain the elasticity and accelerates the renewal of skin cells. Ideal properties of a face scrub are: Mild abrasive, Non-stick, Non-toxic, removes dirt and dead skin, Contain small gritty particles, Non-irritant). Generally herbal cosmetics are also referred to as natural cosmetics. herbal cosmetics, referred as products are formulated using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetics benefits only shall be called as herbal cosmetics.

The science of Ayurveda had utilized many herbs and floral to make cosmetics for beautification and protection from external affects the natural content of in the botanicals do not cause any side effects on human body; instead enrich the body with nutrients and other useful minerals. The natural herbs and their products when used for their aromatic value in cosmetics preparation are termed as herbal cosmetics. The increase demand for the natural products has created new avenues in cosmetics market. Herbal medicines have long history of use and better patient tolerance as well as acceptance medicinal plants have a renewable source which Is due only hope for sustainable supplies of cheaper medicines for the world growing populations. There are a number of herbs that are used for their medicinal and cosmetics properties, Limonia acidissima is one of them. Different parts of Limonia acidissima are responsible for different medicinal as well as cosmetics properties.

L. acidissima is a huge source of vitamin C and it contains 4 times vitamin C than any other citrus fruits. Vitamins C help in Immunity improvement and also protect against common infections and pathogen. L. acidissima contains anti-oxidant like B-carotene which helps defend the skin from Aging and wrinkles. It also contains vitamin A, B helps in getting cleared of skin discoloration, dark circles, redness, and acne irritation it is also known to be defensive against skin cancer by blocking UV rays the outer shell of L.acidissima to eliminate minor spots and lesions on the skin

## Scrubbing

**Scrubbing:** It is the process of eliminating dead skin cells from the surface of your skin using the granulated substance and exfoliator tool.

A facial scrub is generally a cream and Gel-based product that contains tiny exfoliating pieces. a facial scrub is an added a step above and beyond a basic cleanser-toner-moisturizer routine.

### Ideal properties of a Scrub

- Non-toxic
- Possess small gritty particles
- Mild abrasive
- Non-irritant
- Non-sticky
- Removes dead skin

### Benefits of Scrubbing Your Skin:

#### 1. For cleaning Skin:

Scrubbing gives you clean skin, free from dirt, oil, and sweat. Actually, the bottles of cleansing milk, face wash and facial cleansers cannot pull out all the dust that accumulates in the pores of your skin. Scrubbing does this job successfully.

#### 2. Frees your skin from flakes:

Flaky skin gives rise to dry patches. It allows dead cells accumulate over time. Scrubbing your skin can help you deal with flaky skin effectively.

#### 3. Helps in removing dead cells:

Dead cells make your skin look dull and tired. Scrub them off with a gentle scrub.

#### 4. Glow to skin:

Exfoliation can actually make your skin glow.

#### 5. Removes dark patches:

Use of scrub twice a week to get results. It is especially effective on knuckles, elbows and knees.

#### 6. Removes acne scars:

Exfoliation helps in doing away with acne scars.

#### 7. Prevents ingrown hair:

Ingrown hair is a perennial problem and scrubbing is the solution to prevent this problem.

#### 8. For smooth skin:

Smooth skin is the key to a more beautiful you. The scrub will not only make your skin look flawlessly smooth, but will also make it soft and well-nourished.

**9. Improves the texture of your skin:**

Scrubbing your skin gives you clean and smooth skin with an improved texture.

**10. Promotes clear complexion:**

As soon as the flakes, dead cells, blemishes and accumulated impurities are done away. The scrub has natural skin whitening ingredient, the effect is even better.

**ADVANTAGES OF FACE SCRUB**

- Healthy, glowing skin, minimise spore, reduces breakout and acne, Hides wrinkles
- Allows absorption of the products, improve your tan, Maintain body pH.
- Scrubbing is the removal of dry/ dead skin cells on the surface of the skin and is one of the most important of skincare routine for face.
- Scrubbing not only helps many skin problems, it also increases blood circulation, which in turn helps you to achieve healthy and glowing skin.
- Abrasive scrub cleansers are used for mechanical exfoliation

**Disadvantages of scrub**

- Hard scrubbing motions and hard scrubbing chemicals may cause skin irritation including redness, inflammation. If you have a sensitive skin one can also have allergic reactions to the chemicals present in the synthetic scrubs as well.
- Over scrubbing can result in open pores which are exposed to pollution and UV rays at the same time. It also leaves your skin more prone to infections and tanning

**Precautions to be taken while applying a scrub:**

- A Scrub is selected based on the skin type.
- Excessive Scrub and rubbing can damage the skin.
- Do not Scrub skin if any open wounds, cuts, and sunburns present.
- Apply twice a week.
- Thoroughly rinse with water.

**What is Exfoliant?**

A facial scrub uses small particles, beads or chemicals to get rid of the old skin cells and make way for new once in a process known as exfoliation. The agents are used for exfoliation are known as exfoliants.

Exfoliating agents are those used to remove dead cells present on the skin and boost blood circulation, giving renewed and glowing skin. It keeps face free from dust, grime and oils which are also beneficial in keeping a skin pore clean.

Exfoliation involves the removal of the oldest dead skin cells from the skin's surface. The word comes from the Latin word exfoliate (to strip off leaves). Exfoliation is involved in all facials and can be achieved by mechanical or chemical means, such as microdermabrasion or chemical peels. Exfoliants are often advertised as treatments that promote beauty, youthful appearance, or health.

In this formulation we use *L. acidissima* fruit outer shell powder as Exfoliant.

**Limonia acidissima**

*Limonia acidissima* is the only species within the monotypic genus *Limonia*. It is also known as wood apple belonging to family Rutaceae. It is globally reported from India, Sri Lanka, and Java it is occur in dry regions. *Limonia acidissima* (L.) of family Rutaceae (Citrus family) belongs to the monotypic genus elephant-apple, monkey fruit, curd fruit, kath bel and kaitha.

This plant is given as a medicine for the treatment of various disorders. *L. acidissima* is a deciduous, slow-growing, erect tree with a few upward-reaching branches bending outwards near the summit where they are subdivided into slender branchlets drooping at the tips.

Its fruit is spherical in shape with 5- 12.5 cm diameter. The rind is greyish-white in color and 6 mm thick. It has woody and extremely hard outer shell (called as rind) which is very difficult to crack open. Hammer is used to crack the hard rind of wood-apple fruit.

The Pulp is brown, mealy, aromatic, resinous, sour or sweetish with many small white seeds embedded in it. Syrups, drinks, jellies and jams can be prepared from its sticky pulp. The valuable parts of the plant include its roots, fruits, bark and the leaves which are used for various therapeutic purposes.



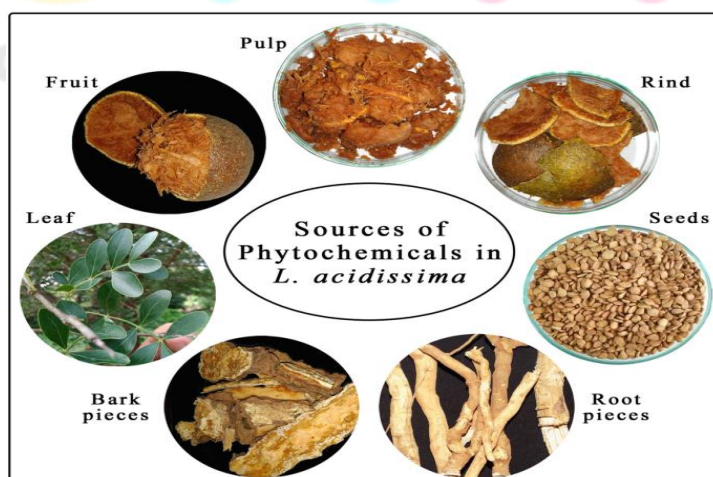
Fig. *Limonia acidissima*

## TAXONOMICAL CLASSIFICATION

<b>Kingdom</b>	<b>Plantae</b>
<b>Sub-Kingdom</b>	<b>Tracheobionta</b>
<b>Super division</b>	<b>Spermatophyta</b>
<b>Division</b>	<b>Magnoliophyta</b>
<b>Class</b>	<b>Magnoliopsida</b>
<b>Sub-Class</b>	<b>Rosidae</b>
<b>Order</b>	<b>Sapindales</b>
<b>Family</b>	<b>Rutaceae</b>
<b>Genus</b>	<b>Limonia L.</b>
<b>Species</b>	<b>L. acidissima</b>
<b>Synonyms</b>	<b>Feroniaele phantum Correa, Feronia limonia (L.) Swingle, Schinus limonia L.</b>

PHYTOCONSTITUENTS OF *L. ACIDISSIMA*

The analysis of *Limonia acidissima* plant parts showed the presence of alkaloids, flavonoids, phenols, terpenoids, tannins, fats, steroids, saponins, glycosides, gum, mucilage, and fixed oils. The unripe fruits contain stigmaterol. Fruit pulp contains a large quantity of citric acid and other fruit acids, mucilage and minerals. Alkaloids, coumarins, fatty acids, and sterols have been detected in the pericarp. It also contains umbelliferone, dictamnine, xanthoxol, scoparone, xanthotoxin, isopimpinellin, isoimperatorin and marmin. Leaves contain stigmaterol, psoralen, bergapten, orientin, vitedin, saponarin, tannins, and essential oil. Marmesin, feronolide, and feronone have been isolated from the carbohydrates, proteins and amino acids. Roots contain feronia lactone, geranylum belliferone, bargapten, osthol, isopimpinellin, marmesin, and marmin. Seeds contain fixed oil.

Fig. sources of phytochemicals in *L.acidissima*

## Turmeric Powder

Turmeric is a spice scientifically known as *Curcuma longa*. It has anti-inflammatory, antimicrobial and antioxidant properties that help to manage several skin issues like signs of aging, pigmentation, acne, etc.

Turmeric has a bioactive component called curcumin which makes it anti-inflammatory. The key health benefits of turmeric come from this curcumin.

Turmeric is easily available in every Indian household. Therefore, it is the go-to skincare treatment for many of us. Western people too have started using turmeric as an important skincare ingredient. Several skincare products available internationally often contain turmeric as a primary ingredient.



Fig.Turmeric

- ❖ **Biological source** - It consists of dried rhizomes of *Curcuma longa* belonging to family Zingiberaceae.
- ❖ **Description** - Colour - Yellow Odour - Aromatic Taste - Bitter
- ❖ **Chief chemical constituents** - Curcumin, Curcuminoids

**Turmeric has several skin enhancing properties.**

### 1. Adds natural glow to your skin

Turmeric is considered to be a potent ingredient for skin lightening and revealing glow. It is a powerful antioxidant ingredient that can reduce dark spots, blemishes and hyperpigmentation. You may have noticed in most Indian weddings, turmeric or haldi is used in the rituals. It is done to add some natural glow to the skin on your big day. The antioxidants and anti-inflammatory properties in turmeric give luster to your skin, reviving it by bringing out a natural glow.

### 2. Treats acne breakouts

Cutibacterium acnes bacteria can cause lesion type acne on your skin. Turmeric can be great to treat this type of acne breakout. A study in Pharma Tutor suggests that the active component in turmeric called curcumin has potent antioxidant properties that can fight against acne vulgaris. The anti-inflammatory nature of turmeric reduces skin inflammation and eventually heals the skin.

### 3.Slows down skin ageing

Your skin often gets exposed to UV rays and environmental pollution. It disturbs the skin's natural oil balance and your skin starts losing elasticity which shows up as ageing signs like fine lines, wrinkles, age spots etc. Similarly, free radicals damage your skin cells and speed up the ageing process. Usually, the ageing signs first appear around your eyes, forehead and neck. Curcumin being a high antioxidant compound boosts your collagen production and strengthens the elasticity of your skin.

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<b>Division</b>	<b>Magnoliophyta</b>
<b>Class</b>	<b>Magnoliopsida</b>
<b>Sub-Class</b>	<b>Zingibridae</b>
<b>Order</b>	<b>Zingiberales</b>
<b>Family</b>	<b>Zingiberaceae</b>
<b>Genus</b>	<b>Curcuma</b>

<b>Species</b>	<b>Longa</b>
<b>Synonyms</b>	<b>Curcuma, curcumin, haldi, haridra</b>

### PHYTOCONSTITUENTS OF TURMERIC POWDER

Turmeric powder is about 60–70% carbohydrates, 6–13% water, 6–8% protein, 5–10% fat, 3–7% dietary minerals, 3–7% essential oils, 2–7% dietary fiber, and 1–6% curcuminoids. The golden yellow color of turmeric is due to curcumin.

Phytochemical components of turmeric include diarylheptanoids, a class including numerous curcuminoids, such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin.

Curcumin constitutes up to 3.14% of assayed commercial samples of turmeric powder (the average was 1.51%); curry powder contains much less (an average of 0.29%). Some 34 essential oils are present in turmeric, among which turmerone, germacrone, atlantone, and zingiberene are major constituents.

### MATERIALS AND METHOD

#### 1) Selection of active ingredient

The analysis of *Limonia acidissima* plant parts showed the presence of alkaloids, flavonoids, phenols, terpenoids, tannins, fats, steroids, saponins, glycosides, gum, mucilage, and fixed oils. Fruit contains some useful phytochemical constituent like vitamins, Antioxidants, Lycopene Carotenoids, etc

Turmeric has anti-inflammatory, antimicrobial and antioxidant properties that help to manage several skin issues like signs of aging, pigmentation, acne, etc.

#### 2) Collection and Authentication

*Limonia acidissima* fruit were collect from local area and prepare outer shell powder and turmeric powder purchase from market.

#### 3) Selection of base

The main objective of the present study was to prepare a multi-purpose herbal scrub incorporated into the gel, hence gel base are used

##### a) Carbopol 940: Gelling agent

In this preparation Carbopol are used to prepare gel because, Carbopol contain good consistency and gel become whiter or clear.

##### b) Propylene glycol: Moisturizer

It is the clear liquid acts as a humectant and one of the most effective moisturizer

##### c) Triethanolamine: Neutralizer

TEA is acts as pH adjuster also acts as emulsifier.

##### d) Sodium Lauryl Sulphate: Foaming agent

It is a widely used surfactant in cleaning products, cosmetics, and personal care products. SLS is also used in lower concentrations in household and personal care products.

##### e) Distilled Water: Solvent

It is universal solvent acts as hydrating agent.

### FORMULA FOR HERBAL SCRUB

Ingredient	Category	Quantity
<b>L.acidissima (outer shell powder)</b>	<b>Exfoliate Skin</b>	<b>5gm</b>
<b>Turmeric powder</b>	<b>Anti-aging, Anti-Oxidant Anti-Wrinkles</b>	<b>2gm</b>
<b>Carbopol 940</b>	<b>Gelling agent</b>	<b>1gm</b>
<b>Propylene glycol:</b>	<b>Moisturizer</b>	<b>1ml</b>
<b>Triethanolamine:</b>	<b>Neutralizer</b>	<b>1ml</b>
<b>Sodium Lauryl Sulphate</b>	<b>Foaming agent</b>	<b>1gm</b>
<b>Methyl Paraben</b>	<b>Preservative</b>	<b>0.15</b>
<b>Distilled Water</b>	<b>Solvent</b>	<b>q.s</b>

**Procedure for preparation of L.acidissima outer shell powder :**

- The fresh fruits was collected from the local market. fruit was dried hot air oven at 40°C to avoid degradation of phytoconstituents
- After drying material was coarsely powered with grinding mill and kept in well closed container.

**Preparation of herbal face scrub:**

1. Take required quantity water in beacker A weighed quantity of carbopol 940 was added little by little in a homogenizer until uniform gel was obtained.
2. Then weighed quantity of propylene glycol, and sodium lauryl sulphate was added and dissolved.
3. Fruit outer shell powder and turmeric powder are added then triturated well then add weighed quantity of Methyl Paraben
4. last triethanolamine was added to adjust the pH

**EVALUATION PARAMETERS****Appearance:**

The prepared scrub was evaluated for its odour and colour. The colour was found to be yellow in colour and odour was found to be characteristics.

**Consistency:**

It was found to be semisolid and homogeneity with visual observation.

**pH:**

pH of the prepared scrub was evaluated. Small amount of the gel was applied on the pH paper and found to be 7.2. It is a neutral in nature.

**Spreadability:**

The spreadability is very important in the behavior of gel that comes out from the tube. It is used to identify the extend of spreadability by the gel on the skin. A small quantity of sample was placed on a glass slide and another slide was placed above them; 100 g of weight was placed on the slide. The time taken for the gel to spread on the slide was noted and measured which was found to be 4 cm in 60 sec.

It was calculated by using following formula:

$$S = m \times l/t$$

S= Spreadability

m=Weight placed on the slide

l=Length of the glass slide

t=Time taken in seconds

**Irritability:**

A small amount of the gel was applied on the skin and kept for few minutes and found to be non-irritated.

**Washability:**

A little quantity of gel was applied over the skin and was wash with water and it was easily washable.

**Grittiness:**

Gel was found to have a few gritty particles.

**Foamability:**

Small amount of scrub was shaken with water in a graduated measuring cylinder and foam was measured.

**Viscosity:**

Brookfield Viscometer was used to measure the viscosity of the gel. The viscosity was found to be 1246 centipoise.



Sr. No	Parameter	Observation
1	Colour	Yellow
2	Odour	Aromatic
3	Consistency	Good
4	pH	7.2
5	Viscosity	1246 centipoise
6	Spreadability	6.6 cm
7	Washability	Easily washable
8	Grittiness	Presence of gritty particles
9	Foamability	good
10	Irritability	Non irritant

## RESULT

Herbal scrub was prepared and evaluated. It contains Turmeric powder which possesses antioxidant, anti-aging, and anti-wrinkle skin tightening lightening and brightening property. It also contains outer shell powder of Fruit acting as a natural exfoliating agent the skin surface by releasing dead cell and pore-blocking impurities. They can exfoliate the skin without scratching the skin surface by applying pressure on them. Suitable base materials such as gelling agent, preservative, neutralizer, and foaming agent were selected and incorporated into the formulation to design a suitable herbal gel. Evaluation parameters such as colour, odour, consistency, pH, viscosity, spreadability, washability, grittiness, foamability, irritability were checked.

## CONCLUSION

The current work was done to prepare a multipurpose herbal scrub using an appropriate base to form a gel. The prepared scrub gel was evaluated using various parameters and was found to be satisfied with the application on the skin to make it healthy and glowing without any side effects. Turmeric powder are natural anti-aging and anti-wrinkle agents and outer shell powder of *Limonia acidissima* fruit are natural exfoliation to skin they are incorporated into the formulation which increases the efficiency of the product.

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