

ORION  
SCHOLAR JOURNALS

# International Journal of Scientific Research Updates

Journal homepage: <https://orionjournals.com/ijsru/>

ISSN: 2783-0160 (Online)



(RESEARCH ARTICLE)



## Formulation and evaluation of herbal face scrub

Sushil Kumar Pal \*, Shashank Tiwari, Sunil Mishra and Dhirendra Maruya

Lucknow Model College of Pharmacy, Lucknow, India.

International Journal of Scientific Research Updates, 2024, 08(02), 001–011

Publication history: Received on 10 August 2024; revised on 28 September 2024; accepted on 01 October 2024

Article DOI: <https://doi.org/10.53430/ijsru.2024.8.2.0052>

### Abstract

Herbal face scrubs have become increasingly popular in recent years due to their ability to improve skin health and are available at a low cost. These scrubs contain natural ingredients such as rice powder and orange peel powder, ficus religiosa etc. Which work to exfoliate, whiten, and prevent free radical damage. Vitamin E, rose Oil, and almonds are used to hydrate and exfoliate the skin. Neutralizers and herbal preservatives like neem, and rosemary are used in the various formulations. The preparation was evaluated for various parameters, such as colour, odour consistency, pH, spreadability, viscosity, and foamability. The results from the evaluation indicated that the scrub was satisfactory after application and was non-irritating to the skin.

*Ficus religiosa* L., commonly known as Peepal tree known to be a native Indian is a medicinally important tree species belonging to the Moraceae family. It is a large evergreen tree found throughout the India. This tree is popular indigenous system of medicine like Ayurveda, Siddha, Unani, and Homeopathy. *Ficus religiosa* is sacred tree, which is having great traditional uses as well as pharmacological activities. Almost all parts of the tree are useful in traditional system. The various parts like leaf, bark, fruit, and seeds are beneficial in treatment of gastrointestinal diseases, healing and curative, heart diseases, constipation, mumps and boils, gynaecological problems, fever and joint pains, respiratory problems, skin diseases orodental and ear problems. *Ficus religiosa* tree shows pharmacological activities analgesic, antioxidant, anticonvulsant, antimicrobial, wound healing, ant amnesic, anti-acetyl cholinesterase, proteolytic activity. The present review is hence an effort to give detailed survey of the literature on its pharmacognosy, photochemistry and medicinal applications.

**Keyword:** *Ficus religiosa*; Glycerine; Rose oil; Steric acid; Vit. E

### 1 Introduction

The Greek term "kosmtikos," which means to have authority, order, or ability in decorating, is where the English word "cosmetic" originates. As they were developed, the history of man is a continuous tale of the development of beauty care products. The man in 3000 BC used colour for enrichment and to entice (1-3). The man survived attacks from the same monsters that he wanted to pursue by colouring his skin and adorning his body for protection to make an opponent dread him (whether man or animal).

A face scrub is an effective way to cleanse the skin, remove dirt, grime, and oil from the pores, maintain elasticity, and promote the regeneration of skin cells. It exfoliates the skin and stimulates blood circulation, while also eliminates dead skin cells. The ideal properties of face scrubs are mild abrasive and non-aggressive.

\* Corresponding author: Sushil Kumar Pal

Herbal exfoliating scrub helps to reduce the effects of age-related changes on the skin and neutralizes the damage caused by the environment. It can be used to technically clean the surface of the skin or to remove dead skin cells by using herbal products with anti-aging, vitamin, antioxidant, and antiseptic properties.

.The scrub is suitable for all skin types. Three different skin types are sensitive, oily, and dry skin. After using the scrub gel, gentle massage is recommended to stimulate blood circulation and oxygenate all skin areas.

A facial scrub is a cosmetic or a beauty product used to exfoliate and clean the skin on the face and body. Blackheads, whiteheads, sebum, and skin cells can all be removed with the help of facial scrubs. It also supports keeping skin looking good.

Scrubbing is utilised to treat every skin condition, regardless of the type of skin .The skin's surface needs to be cleaned frequently in order to remove grime, sebum, and other secretions, dead cells, crusts, and makeup that has been applied in order to stay healthy and attractive.

Oily skin, sensitive skin, and dry skin are the three different types of skin. Use the face scrub, which has hydrating and moisturising components, if you have dry skin. A gentle scrub should be used if the person has sensitive skin..Face scrubs should be used twice or three times a week, depending on the kind of skin. But it's advised to use face washes once a week for beginners.

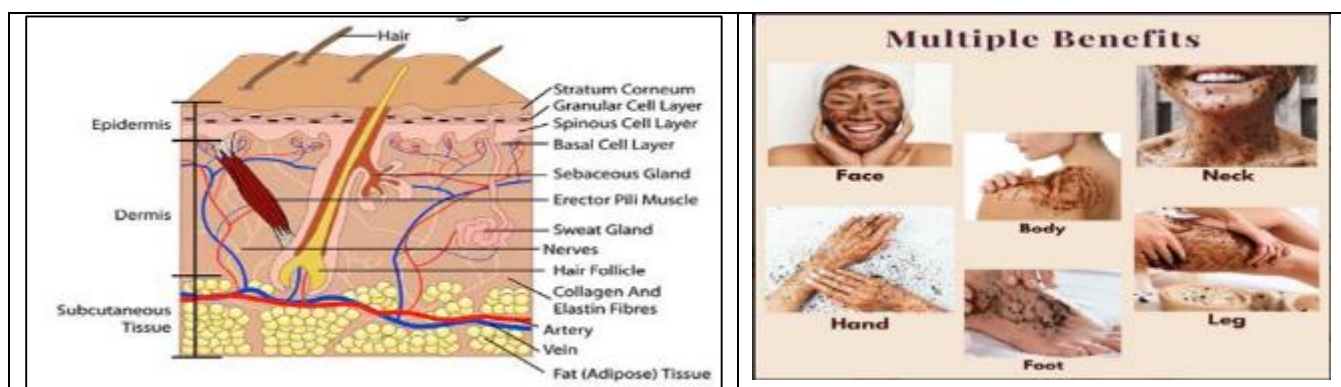


Figure 1 Application on skin

### 1.1 Definition of cosmetics

The cosmetics, according to the Drugs and Cosmetics Act is characterized as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, advancing attractiveness or modifying the appearance. The cosmetic does not come beneath the preview of drug license”.

### 1.2 Definition of Herbal Cosmetics

These are the makeup which are prepared utilizing plant products having cosmetic actions. Recently the utilize of botanicals in beauty care products have expanded primarily due to the mild action and non- toxic nature. In cosmetics, both natural and Phyto-ingredients are utilized. Natural products Include oils, extracts, secretions etc. Phyto-ingredients include unadulterated constituents obtained by different process.

### 1.3 Herbal Cosmetics for Various Types of Skin

#### 1.3.1 For Dry Skin

- Example of Herbs
- Rubia Cardifolia (Manjistha),Triphla, Tulsi,Glycerihza glabra in sesame oil,Fruit face mask,Banana or avocado pulp etc.

#### 1.3.2 For Sensitive Skin

- Example of Herbs
- Curcuma longa,Triphala,Azadircta indica mustaka,Nimba in coconut oil,Fruit face mask

- Banana or pineapple pulp etc.

### 1.3.3 For Oily Skin

- Example of Herbs
- Tulsi, Idhora, Nimba, Curcuma longa, Fruit face mask, Strawberry or papaya pulp.

## 1.4 Benefits of scrubbing in the skin

- Provides individuals with a clean complexion free of dirt, oil, sweat, and other impurities.
- Exfoliation is an effective way to remove all the dust that accumulates in the skin's pores.
- Scrubbing can help to free skin from dry spots caused by irritated skin and can assist in managing irritated skin more effectively.
- Exfoliation can also help to restore a healthy glow to the skin. Additionally, exfoliation can help to remove dark patches on the skin, particularly on the knees, elbows, and knuckles.
- 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.
- Improves the Texture of Your Skin: Scrubbing your skin gives you clean and smooth skin with an improved texture.
- Adds Glow to Skin: Exfoliation can actually make your skin glow.
- Removes Dark Patches: Use of scrub twice a week to get results. It is especially effective on knuckles, elbows and knees.
- Removes Acne Scars: Exfoliation helps in doing away with acne scars.
- 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.

### 1.4.1 Advantages

- Rejuvenation (the act of restoring to a more youthful condition) of the skin.
- Removes dead skin.
- Imparts glow to the skin.
- Removes scars
- Exfoliation improves the quality and tone of skin by assisting in the removal of dead skin cells from the surface.
- Healthy, glowing skin, minimise spore, reduces breakout and acne, Hides wrinkles
- Abrasive scrub cleansers are used for mechanical exfoliation.

### 1.4.2 Disadvantage

- Chemicals and hard-scrubbing motions may irritate the skin and result in redness and inflammation. People with delicate skin may experience allergic reactions to the ingredients in synthetic scrubs.
- Excessive cleaning can leave pores open, exposing skin to both UV radiation and debris. Your skin becomes more vulnerable to infections and tanning as a result
- Too much scrubbing will disrupt this layer and make the skin more sensitive to UV rays, leading to easy tanning, rashes and sunburns. Also, the creams used for scrubs can block pores and cause whiteheads and infection of hair follicles, known as folliculitis.

## 1.5 Difference between herbal and synthetic products

**Table 1** Difference between herbal and synthetic products

Herbal Scrub	Synthetic scrub
Herbal products are completely free from all the harmful chemicals as they are naturally derived.	Synthetic product are maybe slightly harmful Chemical as they are Synthetically derived.
Herbal refer to products that are prepared from plants for their medicinal value.	Synthetic refer to product that are prepared from chemicals.
Safe to use as compared to chemical-based cosmetics.	They may be harmful for sensitive skin
Synthetic refer to product that are prepared from chemicals	More side effect than herbal product
E.g. Plum Green Tea gentle revival Bodyscrub	E.g. Cetaphil Extra gentle daily scrub

## 2 Materials and methods

### 2.1 Application of API (Active pharmaceutical ingredients)

#### 2.1.1 *Ficus religiosa* (Peepal Tree)

*Ficus religiosa*, commonly known as Peepal, is the most popular member of the genus *Ficus* and it is known by more than 150 names. *Ficus religiosa* has got mythological, religious and medicinal importance in Indian culture. References to *Ficus religiosa* are found in several ancient holy texts like Arthasastra, Puranas, Upanishads, Ramayana Mahabharata, Bhagavadgita and Buddhist literature etc.

#### 2.1.2 Taxonomy / botanical classification

**Table 2** Classification of *Ficus religiosa*

Domain	Eukaryota
Kingdom	Plantae
Phylum	Tracheophyta
Class	MagnoliopsidaBrongniart.
Family	Moraceae
Division	Magnoliophyta
Tribe	Ficeae
Genus	<i>Ficus</i> (FY-kus) Linnaeus

#### 2.1.3 Nomenclature

'Ficus' is the Latin word for 'Fig', the fruit of the tree. 'Religiosa' refers to 'religion' because the tree is sacred in both Hinduism and Buddhism and is very frequently planted in temples and shrines of both faiths. 'Bodhi' or its short form 'Bo' means 'supreme knowledge' or 'awakening' in the old Indian languages. 'Pipal' relates (I believe) to the same ancient roots which give rise to English words like 'Pip' and 'Apple' and therefore mean something like 'fruit-bearing tree'. 'Ashwattha' and 'Ashvattha' come from an ancient Indian root word "Shwa" means 'morning' or 'tomorrow'.

#### 2.1.4 Habitat

*Ficus religiosa* is known to be a native Indian tree, and thought to be originating mainly in Northern and Eastern India, where it widely found in uplands and plane areas and grows up to about 1650 meters or 5000 ft in the mountainous areas. It is also found growing elsewhere in India and throughout the subcontinent and Southern Asia, especially in Buddhist countries, wild or cultivated.

#### 2.1.5 Traditional Uses

*F. religiosa* is a well known ethnomedicinal tree used in Ayurveda. Its use in the Indian traditional folk medicine also well documented. The use of different parts of *F. religiosa* in traditional system of medicine.

## 2.2 Macroscopic characteristics

### 2.2.1 General Morphology

*Ficus religiosa* Linn (Moraceae) commonly known as 'Peepal tree' is a large widely branched tree with leathery, heart-shaped, long-tipped leaves on long slender petioles and purple fruits growing in pairs. This big and old tree is of 30m long. Small tree or taller strangling climber, with wide-spreading branches, semi or fully deciduous in monsoon climates and broadly ovate, glossy, leathery, dark green leaves, 5-7 in (12-18 cm) long, with unusual tail-like tips. Bears pairs of rounded, flat-topped green figs, to 1/2 inch (1.5 cm) across, ripening to purple with red dots. The trunk has smooth grey bark and with age this trunk becomes irregularly shaped. It becomes leafless for a brief period in dry habitats.

## Bark

Bark occurs in flat or slightly curved pieces, varying from 1.0 - 2.5 cm or more in thickness; outer surface brown or ash colored; surface uneven due to exfoliation of cork; inner surfaces smooth and somewhat brownish; fracture -fibrous; taste - astringent.



**Figure 2** *Ficus religiosa* Bark Ash

## Glycerine



**Figure 3** Glycerin

- Glycerine uses as moisturiser.
- It soothes dry and irritated skin.
- It treated acne and scars.
- It helps to reduce wrinkles.
- It has Anti - aging property.
- It is used as cleanser.
- It improve skin permeability.

## Rose oil



**Figure 4** Rose oil

- It helps to sooth skin irritation.
- It hydrate and moisturize the skin.
- It helps maintain the skin's ph balance.
- It improve skin texture and softness.
- It has anti- inflammatory property.

## Steric Acid



**Figure 5** Steric acid

- Steric acid used as emulsifier to thicken and stabilized the lotion.
- It has emollient property which helps to moisturize the skin to keep it softer and smoother.
- It helps the skin's pH level.

## Coconut oil



**Figure 6** Coconut oil

- Coconut oil is moisturizing agent and provide dry skin.
- It promote wound healing and reduce inflammation.
- It contain antibacterial and antifungal properties.
- It has anti- oxidant property. Coconut oil for dry skin can be used as a deep treatment to nourish dry and cracked skin, replenishing lost moisture and strengthening the skin barrier to retain it. Coconut oil has also been found to help treat eczema and reduce its symptoms of dry, scaly and itchy skin that is prone to rashes.

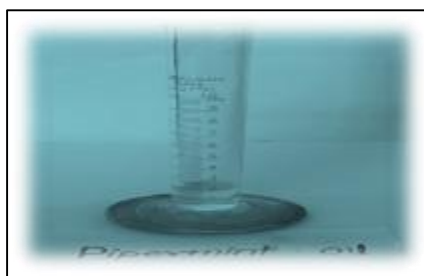
## Vitamine E



**Figure 7** Vitamine E

- Vitamin E prevents and treats low levels of vitamin E in your body. Vitamin E is an antioxidant, which helps to protect your cells.
- Vitamin E plays an important role in maintaining the health of your blood cells, brain, eyes, and skin,
- Applying vitamin E oil from a capsule depends on the skin type. Those who have dry skin can apply vitamin E oil every day as it will keep your face moisturised and soft.

## Peppermint oil



**Figure 8** Peppermint oil

- Peppermint is a common flavouring agent in foods and beverages, and peppermint oil is used as a fragrance in soaps and cosmetics. It has been used for health purposes for several thousand years.
- Peppermint oil or menthol may help remedy pain from headache and migraine attacks when applied in the nose.
- Peppermint oil is promoted for topical use.
- Peppermint oil helps the muscles of the gastrointestinal tract to relax and stimulates the flow of bile.

## Sodium lauryl sulphate (SLS)

- In cosmetics, sodium lauryl sulphate is most often used as an emulsifier or surfactant. As an emulsifier, sodium lauryl sulphate helps to stabilize and thicken solutions with ingredients of differing solubility. This allows products to achieve a more uniform texture for easier, and smoother application.



**Figure 9** Sodium lauryl sulphate

## 2.3 Plan of work

- Selection of plant (*Ficus religiosa*)
- Collection of plant bark.
- With the help of muffle furnace made an ash of peepal bark.
- Formulation of herbal body scrub.
- Evaluation of herbal face scrub. And result discussion.

### 2.3.1 Chemical composition of Herbal Face scrub

**Table 3** Ingredient used in formulation

Sr.No	Ingredient name	Quantity	Category
1	<i>Ficus religiosa</i> ash	10Gm	Anti-microbial
2	Coconut oil	5ml	Moisturizer
3	Rose oil	2.5ml	Anti-oxidant
4	Vitamin E	2.5ml	Anti-inflammatory
5	Glycerin	5ml	Protective agent

6	Pipermint oil	1.5ml	Fragrance and cooling effect
7	Stearic acid	q.s	Thickning Agent
8	Sodium lauryl sulfate	q.s	Foaming Agent

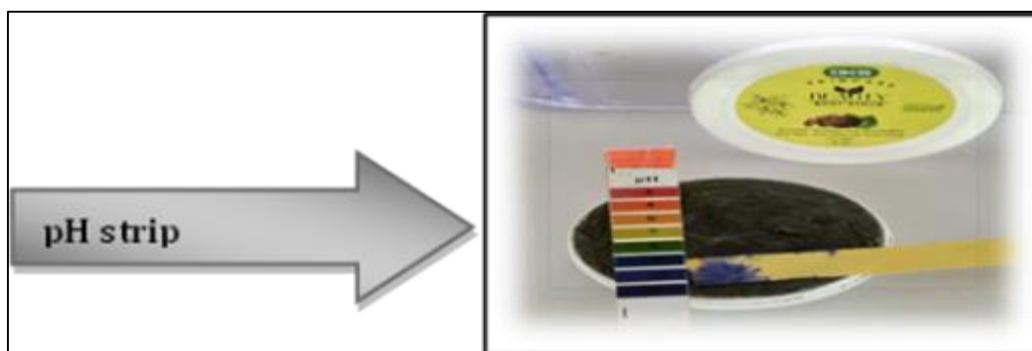
## 2.4 Following step uses in formulation of Herbal Face scrub

- Collect the raw material (peepal bark) from the peepal tree and let him dry in a shade.
- After dry the bark set in the muffle furneshto make a ash set a temperature at 900<sup>o</sup>c fo15-20 minute to made a ash.
- Take a required amount of a *Ficus religiosa* ash in a porcelien disk.sieving the ash with the help of sieve no.120 or 100 and separate it out.
- Transfer the weighed amount of ash in to the mortar-pestal.
- Add another ingredient of the formulation one by onelike; Coconut oil,Rose oil, Vit E, Glycerine, Pipermint oil. Measured 2ml stearic acid pour into mortar pestal with continuous stirring while thicking maitained.
- Mix all the ingredients vigorously.
- Herbal face scrub was prepared.

## 2.5 Evaluation parameters

Evaluation parameter for bodyscrub

- Colour: Yellowish brown colour of facial scrub was observed by visual examination
- Odour: Odour found to be characteristics. Sweet and simple syrup like odour.
- State: Semisolid state of scrub observed by visually.
- Consistency: Consistency was found to be smooth with visual observation.
- pH: pH of the prepared gel evaluated by using PH paper. Small amount of scrub applied on pH paper.pH was found in the range of 8-9



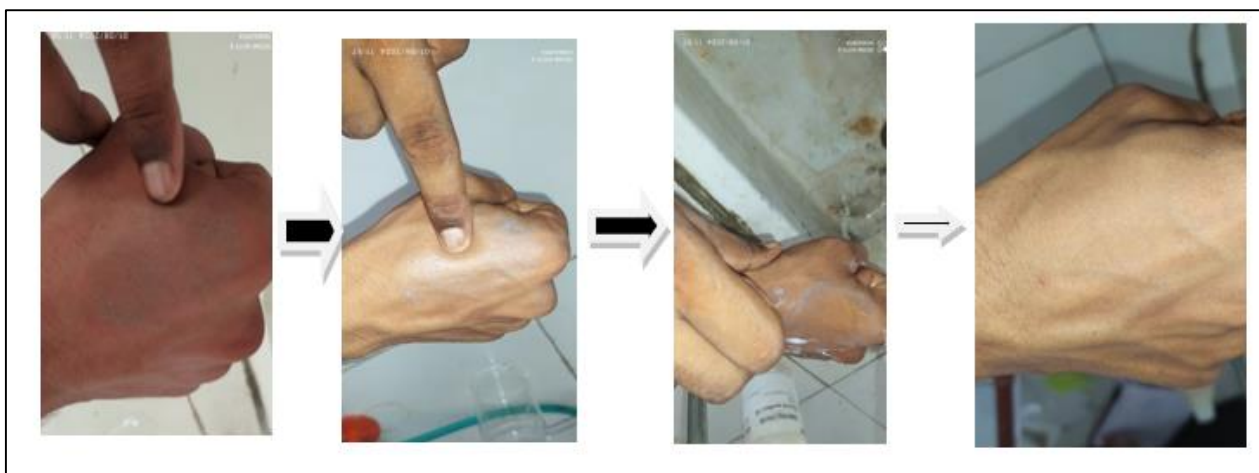
**Figure 10** Checking pH with pH strip

### 2.5.1 Spreadability

It is used to identify spreadability of the gel on the skin.Small quantity of sample placed on a glass slide then another slide placed above them.Amount of weight placed on slide, then it spread on slide and how much time it taken for spread is measured.Calculated by using formula:

- **Irritability:** Small amount of gel applied on skin and kept for few minutes and found to be non- irritable.
- **Washability:** Small quantity of gel applied on the skin and wash with water after few minutes found to be washable with water.





**Figure 11** Checking irritability and washability

- **Grittiness:** Exfoliants need to abrasive property so fenugreek seeds powdered and pass through sieve then this preparation has few gritty particles observed.



**Figure 12** Checking grittiness of a scrub

- **Foaming Test:** Add 1 gm formulation in 5ml water in test tube, shake it for 5 min. Allow it to stand for 15min & Observe the foam height.

### 3 Result and discussion

**Table 4** Provide caption to the table

S.no.	Parameter	Result
1	Colour	Gray colour
2	Odour	Sharp odour
3	pH	8-9
4	Irritability	Non-irritant
5	Foaming test	Foam observed
6	Stability	Stable
7	Grittiness	Grittiness observed
8	Spreadability	Uniform
9	Washability	Easily washable

10	Homogeneity By visual By touch	Smooth Consistent
----	--------------------------------------	----------------------

The herbal face scrub was prepared and evaluated. The herbal face scrub formulated in the laboratory was found to be compared with various parameters such as appearance, pH, and spreadability, washability, irritability and found to be well satisfied with all required characterization. Thus, the developed formulation can be used as an effective scrub for using it to bear a healthy and glowing skin. It contained *Ficus religiosa* bark ash, glycerin, Rose oil, piperment oil, vit. E, coconut oil etc. Which has exfoliation activity, lighten skin tone and reduce dark spots and cleaning of oil and dust particles respectively. The *Ficus religiosa* ash powder was natural exfoliating agent which was used to remove dead cells of skin, gives scrubbing property to the skin and which helps to improve the blood circulation.

#### 4 Conclusion

The aim of formulating an herbal face scrub was prepared successfully with good results. The face scrub showed a good spreadability. The formulation showed a good property on our skin without causing skin irritation or edema. The present study was attempted to make an herbal scrub using suitable base to form a gel. The prepared scrub was compared with various parameters like colour, odour, pH, spreadability, irritability, washability, grittiness, foamability and found to be satisfied with all required characterization. Thus, the developed formulation can be used as an effective scrub for using it to bear a healthy and glowing skin. In this all-natural ingredient were used, so that they had no side effects or fewer side effects. The prepared herbal scrub was found to be satisfied for the application on the skin to make it healthy and glowing. The application of the scrub, which helps to improve blood circulation and increases oxygen supply to all surface of the skin. After application of scrub, skin becomes softer, cleaner and refreshed.

In comparison to other cosmetic products available in the market, natural and herbal cosmetics are easy, safe and effective to use. One of the main reason of herbal products use is that they can be used for all skin types. The major use of herbal products is for health promotion and therapy for serious skin conditions. However, usage of traditional remedies increases when conventional products is ineffective or may causes harmful effects. The use of herbal face scrub gives effectiveness and healthier skin type. The antioxidant, antiseptic, anti aging effect of rose oil and vit.E enhance the importance of use of polyherbal face scrub. The prepared formulation was suitable to skin and was evaluated using various parameters. The formulation have passed all the tests included in evaluation.

#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

#### References

- [1] J. Prathyusha, N.S. Yamani, G. Santosh, A. Arvind, B. Naresh : Formulation and evaluation of polyherbal face scrubber for oily skin in gel form, National a general of pharmaceutical science and drug research 2019; 11(4):126-128.
- [2] Tiwari, Dr & Prakash, Kartikay & Gupta, Polly & Shukla, Trivid & Yadav, Preeti. (2024). Formulation And Evaluation of Face Scrub In Modern Pharmaceutics: A Herbal Formulation. International Journal of Pharmaceutical Sciences. 2. 579-588. 10.5281/zenodo.10827606.
- [3] Glaser DA, Anti-ageing products and cosmeceuticals. Facial Plast Surg, Clin N Am, 2004;12(4): 363-372.
- [4] Draelos ZD, Topical Anti inflammatory agents, Cosmetic Dermatol, 2003; 16(10): 41-42.
- [5] Rousseaux CG and Schachter H, Regulatory issues concerning the safety, efficacy and quality of herbal remedies. Birth Defects Res. B, Dev Reprod Toxicol, 2003; 68(6): 505-510

- [6] Pandey Shivanand, Meshya Nilam, D.Viral, Herbs Play an Important Role in the Field of Cosmetics, International Journal of Pharm Tech Research, 2010; 2(1): 632- 639.
- [7] V P Kapoor, Herbal cosmetics for skin and hair care, Indian Journal of Natural Products and Resources (IJNPR) [Formerly Natural Product Radiance (NPR)], 2005; 4(4): 306-314.
- [8] Draelos ZD, Botanical antioxidants, Cosmetic Dermatol, 2003; 16(10): 41-42.
- [9] J. Prathyusha, N. S. Yamani, G. Santhosh, A. Aravind, B.Naresh. Formulation and Evaluation of Polyherbal Face Scrubber for Oily Skin in Gel Form. International Journal of Pharmaceutical Sciences and Drug Research 2019; 11(4):126-128.
- [10] A Ervina<sup>1</sup>, J Santoso<sup>1</sup>, B F Prasetyo<sup>2</sup>, I Setyaningsih<sup>1</sup> and K Tarman. Formulation and characterization of face scrub using marine alga *Halimeda macroloba*, chitosan and konjac flour. IOP Conference Series: Earth and Environmental Science 414 (2020) 012004.
- [11] Talreja, Shreya & Tiwari, Dr. (2021). A Study Of Alternate Healing Systems: Naturopathy. International Ayurvedic Medical Journal. p5. 10.46607/iamj09p5032021.
- [12] S. B. Aglawe, A. U. Gayke, A. Khurde, D. Mehta, T. Mohare, A. Pangavane, S. Kandalkar. Preparation and evaluation of polyherbal facial scrub. Journal of Drug Delivery & Therapeutics. 2019; 9 (2):61-63.
- [13] S. S. Londhe, M. G. Bhosale, Dr. A. A Joshi, Geeta Sapkale. Formulation and Evaluation of Polyherbal Facial Scrub. International Journal for Scientific Research & Development Vol. 7, Issue 11, 2020 | ISSN (online): 2321-0613
- [14] Parashar Bharat, Sharma Pankaj, Kabra Atul, Sharma Pankaj. Formulation and evaluation of polyherbal face cream. International pharmaceutica scientia| july-september 2013 | vol. 3 |
- [15] Damayanti Hilda, Aprilliani Arini, Clarissa D. Nancy. Formulation of Face scrub Cream From Extract of Arabika Green Coffee (*Coffea arabica* L.) as Antioxidant. Advances in Health Sciences Research, volume 33.
- [16] Mali S and Borges RM. Phenolics, fibre, alkaloids, saponins, and cyanogenic glycosides in a seasonal cloud forest in India. Biochemical Systematics and Ecology. 2003;31:1221-1246.
- [17] Husain A, Virmani OP, Popli SP, Misra LN, Gupta, MM, Srivastava, GN, Abraham Z and Singh AK. Dictionary of Indian Medicinal Plants, CIMAP, Lucknow, India. 1992:546.
- [18] Ali M and Qadry JS. Amino acid composition of fruits and seeds of medicinal plants. Journal of the Indian Chemical Society. 1987;64:230- 231.
- [19] Panda SK, Panda NC and Sahue BK. Effect of tree leaf tannin on dry matter intake by goats. Indian Vet J. 1976;60:660-664.
- [20] Prasad S, Kalra N and Shukla Y. Hepatoprotective Effects of Lupeol and Mango Pulp Extract of Carcinogen Induced Alteration In Swiss Albino Mice. Molecular Nutrition & Food Research. 2007;51(3):352-9.
- [21] Tiwari, Dr & Talreja, Shreya. (2020). A Concept Of Nanotechnology In Cosmetics: A Complete Overview. Adalya. 9. 14-23. 10.37896/aj9.11/003.
- [22] Suryawanshi K, Khakre S, Chourasia A, Chaurasiya PK, Pawar RS and Jhade D. Hepato-protective activity of stem bark extract of *Ficus religiosa* Linn in Rat. International Journal of Biomedical Research. 2011;8:466- 475.
- [23] Sawarkar HA, Singh MK, Pandey AK and Biswas D. In vitro anthelmintic activity of *Ficus bengalensis*, *Ficus caria* & *Ficus religiosa*: a comparative anthelmintic activity. International J PharmTech Research. 2011;3:152-153.
- [24] Roy K, Kumar S and Sarkar S. Wound Healing Potential of Leaf Extracts of *Ficus religiosa* on Wistar albino strain rats. International J PharmTech Research. 2009;1:506-508.
- [25] Hamed MA. Beneficial effect of *Ficus religiosa* Linn. on high fat- induced hypercholesterolemia in rats. Food Chem. 2011;129:162-170.
- [26] Tiwari, Dr & Talreja, Shreya. (2020). A Pharmaceutical And Pharmacological Study Of *Ficus religiosa*: A Systematic Review. International Journal of Pharmacy and Technology. 12. 7109-7121. 10.32318/IJPT/0975-766X/12(3).7109-7121.
- [27] Prasad PV, Subhakttha PK, Narayan A and Rao MM. Medico-historical study of "asvattha"(sacred fig tree). Bulletin of the Indian Institute of History of Medicine (Hyderabad). 2006;36:1-20.