

“Formulation And Evaluation of Polyherbal Face Scrub”

Priti Karpe

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Abstract:

My project deals with the topic titled as “Formulation and Evaluation of Polyherbal Face Scrub”. Herbal cosmetics are the preparations are used to beautify and enhance the human appearances. The aim of the present project was to formulate and evaluate the herbal face scrub containing plant extracts prepared Herbal face scrub was prepared using natural polyherbal ingredients. In this formulation of facial scrub Reetha, Amla, Neem, Sandalwood, Turmeric, and Orange Peel The prepared facial scrub was evaluated for various parameters such as appearance, pH, viscosity, Spreadability, Foamability, washability, irritability and found to be contented with all required characterizations. Thus, this formulation can be used as an efficient facial scrub for using it for the maintenance of healthy and glowing skin

The main objective of the present study is to prepare a multi-herbal facial scrub. Nowadays, cosmetics have become an important part of daily life for both men and women to lead a happy and confident life. Since herbs and spices have been used to preserve and enhance human beauty, as herbs have many beneficial properties such as sun protection, anti-aging, moisturizing, antioxidant, anti-cellulite and antimicrobial. Compared to synthetic cosmetic products, herbal products are gentle, biodegradable and have a low toxicity profile,[1] so we decided to prepare and evaluate a polyherbal facial scrub to protect against acne, scars, tanning, wrinkles, aging and rash.

This facial scrub contains herbs that exhibit antioxidant, antiseptic, antibacterial, skin whitening, fade permanent marks and reduce inflammation properties. Today, cosmetics play an important role in the daily lives of women and men to make the skin glow and change the appearance. The use of natural ingredients to maintain health and look good requires frequent cleaning of the skin surface to remove oil, sebum and other secretions, dead cells, dandruff and applied makeup. Herbal cosmeceuticals usually contain parts of the plant that have antimicrobial, antioxidant and anti-aging properties. It is the safest product to use routinely, without side effects, and cosmetics is the product that affects the biological function of the skin. The

increasing demand for natural and sustainable skin care products has led to the development of multi-herbal facial scrubs that harness the benefits of multiple plant ingredients. This study focuses on the formulation and evaluation of a polyherbal facial scrub with natural exfoliants and plant extracts. Ingredients such as aloe vera, neemreetha power, sandalwood powder, coffee, orange peel powder and amla powder are included. The scrub demonstrated excellent exfoliating properties without causing irritation and improved skin texture, clarity and smoothness after regular use. This polyherbal facial scrub is a natural alternative to synthetic products, offering an eco-friendly and effective solution to maintain healthy and glowing skin.

KEYWORDS: Exfoliation, Natural skincare, Skin friendly, Herbal cosmetics.

I. Literature Review:

1. Skin care with herbal exfoliants :

(NilaniPackianathan, RuckmaniKandasamy : Skin Care with Herbal

Exfoliants, Functional Plant Science and Biotechnology 2010;5(1):94-97)

The given article gives the different types of exfoliation methods such as manual or mechanical skin exfoliation, chemical exfoliation, enzyme exfoliation. The formulation is from luffa, algae extract, grapefruit seed extract, apricot shell cucumber extract, papaya extract, mung dal, pineapple extract, rosehip seed powder, cranberry, green tea, tree tomato. Herbal skin exfoliation is important part of general skin maintenance. It smoothenes and chemically balances skin, unclogs pores and stimulates fresh cell growth, reducing blemishes, discoloration and wrinkles which helps the skin stays healthy and clean, hydrated and blemish free.[5]

2. Formulation and evaluation of multipurpose herbal scrub in gel from using limoniaacidissima:

(Mr.Vishal Ashok Chaudhari, Dr.ManojV.Girase, Mr.BhushanGulabBorase, Mr.Shashikant Kailas Bhoi, Miss.Kalyani Ashok Chaudhari: Formulation and

Evaluation of Multipurpose Herbal Scrub In Gel Form Using LimoniaAcidissima, International

Journal Of Research and Analytical Reviews
2020;7(2))

The Formulation is based on herbal scrub using limoniaacidissima .The objective behind the study was to prepare multi purposeherbal scrub in the form of gel that are used for their medicinal and cosmetic properties and limoniaacidissima is one of them.The valuable part of plant includes its roots, fruits bark and leaves which are used for various therapeutic purposes.Extraction of fruit parts were done and incorporated to gel phase. The formulation contains ethanol extract of Limoniaacidissima fruit pulp which possess antioxidant, anti- aging, anti-wrinkle, skin tightening, lightening and brightening property. They can exfoliate skin without scratching skin surface by applying pressure on them. Suitable base materials such as gelling agents, preservative, neutralizer and foaming agents were selected and incorporated into extract to design a suitableherbal gel. The formulation was evaluated using various parameters and found to be satisfied upon application to skin.[6]

3.Clinical review of deep cleansing apricoat scrub: An herbal formulation: **(Debbarma Dona, Moharana PK, Mishra Baidyanath, Ramana Vivekananda and W Dimple: Clinical Review of deep cleansing apricoat scrub: An Herbal Formulation, International Journal of Bioassays 2015;4(9):4251-4253)**

Exfoliation to your skin care routine helps the natural shedding process of skin and encourages healthier, smoother more even-toned skin some of the big beauty benefits like acne prevention, smaller pores, wrinkles, etc. Herbal medicines have been extensively used in recent years for chronic and lifestyle related disorder. Deep cleansing apricot scrub is a proprietary & patented polyherbal formulation designed to deep cleanse the skin and makes it healthy and glowing. Exfoliation involves the removal of the oldest superficial dead skin cells on the skin's outermost surface. Exfoliation can be achieved through mechanical or chemical means mechanical process involves physically scrubbing the skin with abrasive

4.Antioxidant facial scrub from red dragon fruit extract :

Ligaya Taliana :(Facial Skin Health: Antioxidant Facial Scrub From Red Dragon Fruit

Extract, Journal of Asian Multicultural Research For Medical and Health Science Study 2020;1(2):01-05)

Air pollution and UV rays are Sources of free radicals that are harmful to body. Radicals produced in the body. Can be neutralized by antioxidant that come from the body under normal circumstances,

free facial scrub is a skin care. [8] cosmetic product that contains coarse granules or so called abrasive cosmetics which functions to remove dead skin cells and nourish the skin. This type of facial treatment is type of treatment generally chosen by some women's. Facial is a procedure to clear facial skin from all types of facial treatment impurities. Such as pimples, Whiteheads, blackheads and others.[9]

5.**Vidya KeshavKakad (2002)** - A review on Herbal face scrub for skin exfoliation. Many of the marketed products when applied on the skin cause dryness of skin after its long-term use which results less life of skin problems of acne and redness. Solution for this problem is use of scrub which consist all herbal ingredients which increases cleansing, softening, moisturizing, fairness of skin.

6.**Rutuja PrashantNangare, TruptiAsokThange (2022)** - In comparison to other cosmetic products available in the market, natural and herbal cosmetics are easy, safe and effective to use. The use of polyherbal face scrub gives effectiveness and healthier skin type.

7.**Miss.GadgeRutuja, Miss BhoreShruti, Miss PathanSaniyaMr.Tambe Sager (2022)** – the present study was attempted to preparation polyherbal scrub. the polyherbal scrub was evaluated using parameter and was found to be satisfied for the application on the skin to make healthy and glowing without any side effect.

8.**Pooja Dave (2022)** - the research aimed to produce an herbal facial scrub .The scrub comprises various natural components that are safe for use .The main ingredient is coffee that results suggest that new scrub formulation is safe for use and coffee use to get good effect as scrubbing agent. The majority of the substance are natural and there low chances of adverse effect.

9.**ASurjushe (2008)** - studied the effect of aloe vera Cited by 1067 - It's moisturizing effects has also been studied in treatment of dry skin associated with occupational exposure where aloe vera gel gloves improved the skin.

10.**S J Hewling (2017)** - studied that Turmeric (curcumin) can helps in management of inflammatory and oxidative condition. The World Health Organization refers to "Good-Health" as a state of physical and mental wellbeing not altered by any disease or ailment (Arumugam et al., 2014).

Introduction:

- Skin is one of the largest organs of the body. Skin functions as a protective wrapper, keeping everything beneath it safe from daily threats such as the harsh effects of sun, wind and pollution, germ filled grime. Skin is also a sensory organ,

which indicates the health of an individual. Skin care is very important to make it healthy and fresh; there are so many market preparations for skin care. Skin care is at the interface of cosmetics and dermatology but skin care differs from dermatology, it does not require any medical professional every time.

- Cosmeceuticals are the future generations of skin care. The term cosmetic derived from Greek word 'Kosmetikos' which mean pertaining to cosmetics or beautifying substance or preparation. The word 'cosmesis' (Gr. Kosmesia) used for two things: the preservation restoration or bestowing of body beauty, the surgical correction of disfigured physical effect. Cosmetics are defined as the products used for the purposes of cleansing, beautifying, promoting attractiveness or alternating the appearance. From ancient times, different herbs have been used for cleaning, beautifying and to manage them. Face skin is the major part of the body, which indicates the health of an individual. Skin becomes dull, non-glowing due to various causes and these can effectively be overcome with the application of scrubs.



Fig 1 . Cosmetic Product

- Herbal scrub exfoliation alleviates age-related changes and neutralizes environmental attack by removing skin cells on the surface and stimulating cell growth in the sub-epidermal layer. Mild abrasive agent is one of the key ingredients in facial scrub formulation as it helps the natural shedding process of skin and encourages healthier, smoother, more even-toned skin. Gentle massage is recommended on application of the scrub gel which helps to improve blood circulation and increases oxygen supply to all surfaces of the skin. As you grow older, the rate of cell turnover slows down dramatically. Majorly dead cells found on facial skin to deep cleanse the skin and make it glow and attractive.[10] effects in comparison with other drugs.

Ayurveda health care and healing, works on four levels body, breath, mind and spirit. When these are in perfect harmony, a person radiates with inner and outer beauty. According to Ayurveda, toxic materials inside the body makes a person look unhealthy and his personality weakens. Shodhana (Purification) is the best therapeutic intervention to eliminate body toxins which helps to become disease free and helps to maintain health and beauty. In Ayurveda there are several medicinal plants and mode of applications of their processed formulation for enhancing complexion, treating acne, skin disorders, hair fall, complexion etc. Cosmetics alone are not sufficient for proper skin care, so the addition of active ingredients is necessary to check the damage and ageing of the skin. Recently, herbal cosmetics have gained more popularity and more acceptability among the people than synthetic ones due to their lesser or almost nil side effects. In some cases, synthetic cosmetic products may cause severe damage to human skin as those products may contain harmful chemicals. Natural ingredients like herbs, fruits, flowers, barks, rhizomes, leaves, seeds, spices etc. have been used by both men and women over the whole world and these ingredients are recognized as the best according to their choice. For this reason, at present times, in skin care cosmetic preparations, these natural ingredients are included directly or their extracts and essential oils are used randomly.[11]

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 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. There are two ways to exfoliate the skin. 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

Ideal Properties of Scrub :

An ideal scrub is accepted to possess the following properties. It should be

- No toxic
- Possess small gritty particles
- Mild abrasive
- Non irritating
- Non sticky
- Able to remove dead skin cells

Why scrub

- In a nutshell, lipids are skin's natural fats.
- They are essential components of skin and play a crucial role in maintaining the strength of the skin's protective barrier, which holds moisture, protects the skin from damage and keeps dirt and impurities out.
- The epidermal lipids of keratinocyte origin play an essential role in the skin's barrier function. These lipids provide a barrier against the movement of water and electrolytes as well as a barrier against microorganism invasion.

Precautions to be taken while applying a scrub.

1. A scrub is selected based on the skin type.
2. Excessive scrub & rubbing can damage the skin
3. Do not scrub skin, if any open wounds, cut & sunburn present
4. Apply twice in a week
5. Apply with a rotating motion to face & neck for about 30 sec.
6. Thoroughly rinse with water.

Advantage of Polyherbal Scrub:

The application of the Scrub which helps to improve blood circulation & increases oxygen supply, to all surface of the skin.

1. After application of Scrub, skin become softer cleaner & refreshed.
2. Remove dead skin cells
3. Unlock skin pores
4. Remove Flakes.
5. Reduce Acne Scars.
6. Prevents In grow hair
7. Provides smoother skin.
8. Improves the texture of skin.
9. Better Absorption of skincare product.
10. Drawing out impurities clearing Congestion

Disadvantages

1. Hard scrubbing motions and hard scrubbing chemicals may cause skin irritation including redness, inflammation.

Ingredients of formulation:



• Reetha powder

1) Synonyms - Soap Nut Powder, Arishtakadi Powder

2) Biological Source - Reetha powder is obtained from the dried fruits of *Sapindus mukorossi*, which belongs to the Sapindaceae family.

3) Color Description - Color: Light brown to sandy brown.

4) General Information - Reetha is a natural detergent, mainly known for its high content of natural saponins, which create a soapy lather when mixed with water. Reetha powder is made by drying the fruit husks, removing the seeds and grinding the husks into a fine powder.

5) Family - Sapindaceae

6) Chemical constituents - Saponin, sugars, fatty acids, tannis

7) Uses - Treats acne, eczema and other skin conditions. Acts as an exfoliant to remove dirt and dead skin.

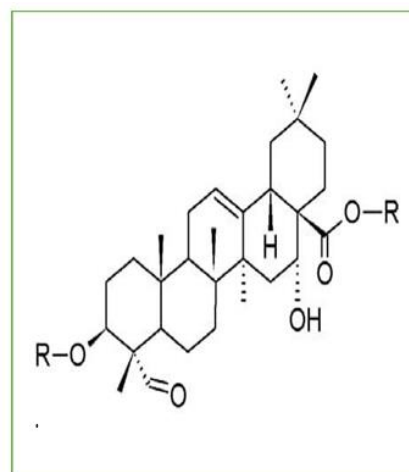


Fig. Saponin



• **Amla Powder:**

- 1)Synonym- Indian eggplant powder, MyrobalanEmblic Powder
- 2)Biological source-Amla powder is prepared from the dried fruits of *Emblicaofficinalis* (*Phyllanthusemblica*), which belongs to the *Phyllanthaceae* family.
- 3)Description (color)- Color-light brown to greenish brown
- 4)General Information- Amla (Indian bitter gourd) is a rich source of vitamin C and antioxidants. The fruits are small, round and yellow-green with a sour and astringent taste. The powder is made by drying the fruit, removing the seeds and grinding the pulp into a fine powder.
- 5)Family - *Phyllanthaceae*
- 6)Chemical constituents -Ascorbic acid ,Ellagic acid , Gallic acid, Tannins
- 7) Uses- Increases immunity and general health, brightens skin and reduces dark spots.

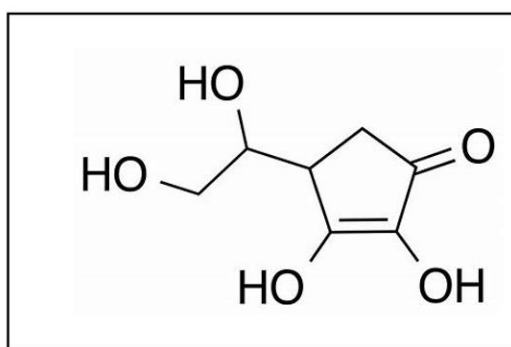


Fig. Ascorbic Acid



Fig 7. Sandalwood

• **Sandalwood Powder:**

- 1)Synonym: Chandan (Hindi), White sandalwood
- 2)Biological Source:
Derived from the heartwood of the tree *Santalum album* (main species used).
Other species include *Santalum spicatum* (Australian sandalwood) and *Santalumpaniculatum* (Hawaiian sandalwood).
- 3)Family: *Santalaceae*
- 4)Order: *Santalales*
- 5)Family- *Santalaceae*
- 6)Chemical constituents - Alpha santalol,Betasantalol
- 7)Colour: Typically light brown to yellowish brown, depending on the source and processing.
- 8)Uses:
Cosmetic: Face masks, skin brightening, anti-acne treatments.

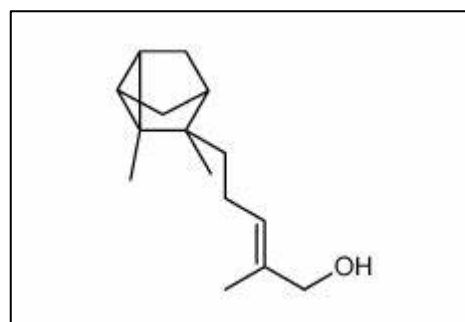


Fig. Alpha Santalol



• **Turmeric Powder:**

- 1)Synonym: Haldi ,Curcuma , Indian Saffron
- 2)Biological Name: Turmeric is obtained from the rhizomes of *Curcuma longa* Linn .
- 3)Colour: Bright Yellow to Orange -yellow.
- 4)General Information:
 1. Turmeric is a perennial herb native to South Asia especially India.
 - 2.The plant grows about 1 meter tall with broad leaves and yellow-white flowers.
 - 3.The rhizomes are boiled, dried, and ground into a deep orange-yellow powder.
- 5)Family -Zingiberaceae
- 6)Chemical constituents -Curcumin,Resins, protein, Sugars
- 7)Family: Zingiberaceae (Ginger family)
- 8)Order: Zingiberales
- Uses:Natural dye and Colouring agent

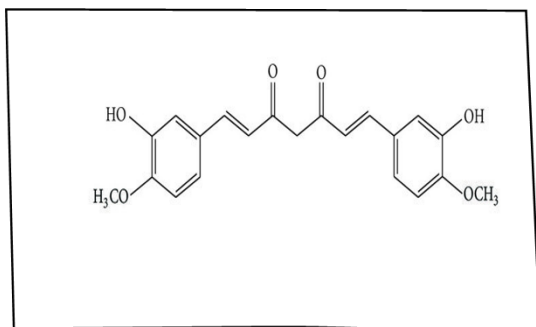


Fig.Curcumin



• **Orange Peel Powder:**

- 1) Synonym:- Orange Zest
- 2)Biological Source:- It consist of dried fruits of *Citrus sinensis*.
- 3)Family:- Rutaceae Description colour:- Dark orange, red etc.
- 4)General information:- An Orange is a type of Citrus fruit whichoften eaten.
Orange is a very good source of vitamins, especially vitamins orange juice is an important part of many people's breakfast.
- 5) Family - Rutaceae
- 6)Chemical constituents -Limonene, Ascorbic acid, Pectin, carotenoids
- 7)Uses:- Reduce skin mark, Skin spots helps to skin whitening, Treat pimples, Acne

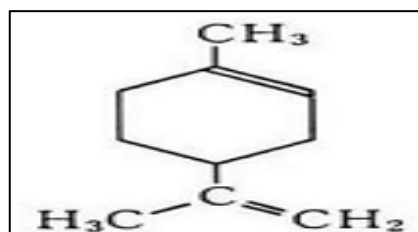


Fig. Limonene



• **Aloe Vera Gel:**

- 1)Synonym:- Aloe, Musabbar
- 2)Biological source: - Aloes is obtained from the dried juice of the leaves of a) *Aloe barbadensis*Miller. b) *Slow perry*l Baker.
- 3)Family: -Asphodelaceae Description Colour - Pale green

4)General Information:- The Aloe vera mean "aloe" meaning shining bitter substance while "vera" mean true Aloe Vera contains vitamin A and C and it also shows anti-inflammatory properties.

5)Uses:-Strong purgative, Laxative, Anti-spasmodic, Irritation and Malignancy, Prevent skin ulceration.

6) Chemical Consistent: Polyphenols and Flavonoids

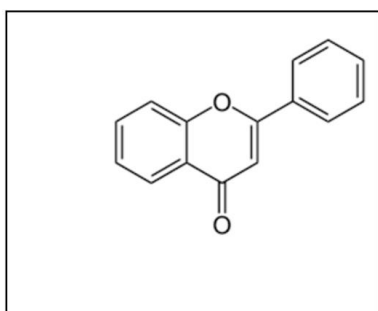


Fig. Flavonoids



• Neem Powder:

1)Synonym: Neem tree

2)Organic source - Consists of dried leaves of Azadirachta indica belonging to the family Meliaceae.

3)Description color - Green Odor - Wild Taste - Bitter.

4)General information- Neem powder is made by drying neem leaves and grinding them into a fine green powder. It is rich in bioactive compounds such as nimbin, nimandial, nimbinin and quercetin, which contribute to its antimicrobial, anti-inflammatory and antioxidant properties.

5)Family - Meliaceae

6)Chemical constituents - Azadirachtin, Triterpenoids, Tannis

7) Uses - Antifungal, antibacterial, antiseptic and anti-inflammatory, relieves wounds

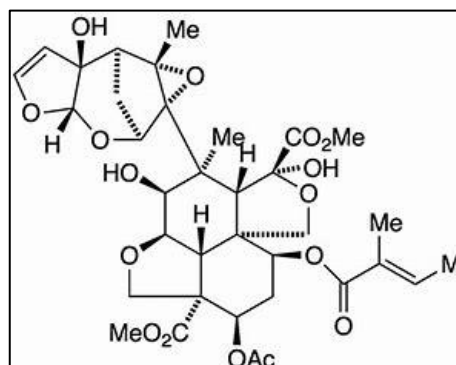


Fig. Azadirachtin



• Rose Water:

1)Synonyms- Margosa

2)Biological source- Rose water comes from the petals and sepals of the Rosa genus of plants
Description – Colour- shead of red

3)General information - kingdom- plantae

4)family- rosaceae

5)order-Rosales

6)Class – Angiosperms

7)Family-Rosaceae

8)Chemical constituents - Phenyl ethyl alcohol, Nerol, Geraniol

9)Uses- Rose water may be an excellent complement to a face scrub. their appearance

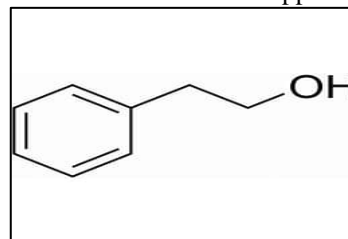


Fig. Phenylethyl alcohol



•Xanthan Gum

1)Synonyms- Guar gum

2)Biological source- bacterium xanthomonascampestris.

3) Description - Colour - White powder. 4)General information - Kingdom- bacteria

5)Family- Xanthomonadaceae.

6) Chemical constituents -D -glucose, Mannose,Glucuronic acid.

7)Class- Gamma subdivision of proteobacteria.

8)Uses- Xanthan gum gives gluten - free doughs and batters elasticity and stickiness so they don't crumble

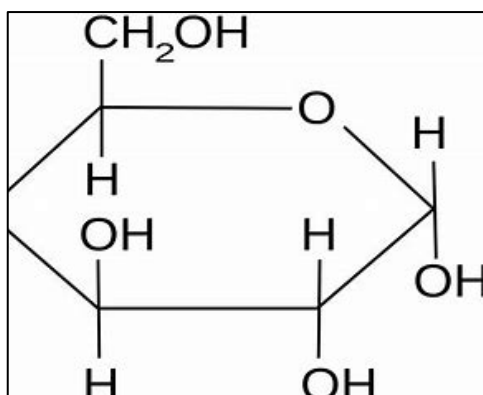


Fig.D-glucose

Sr.No	Herbs	Family	Uses
1	Reetha	Sapindaceae	Cleaning Agent
2	Amla	Phyllanthaceae	Anti-Ageing

			Agent
3	Neem	Meliaceae	Anti-Septic Agent
4	Sandalwood	Santalaceae	Exfolient
5	Turmeric	Zindiberaceae	Anti-Inflammatory Agent
6	Orange peel	Rutaceae	Anti-Oxidant

Table No.1: Details of Herbs

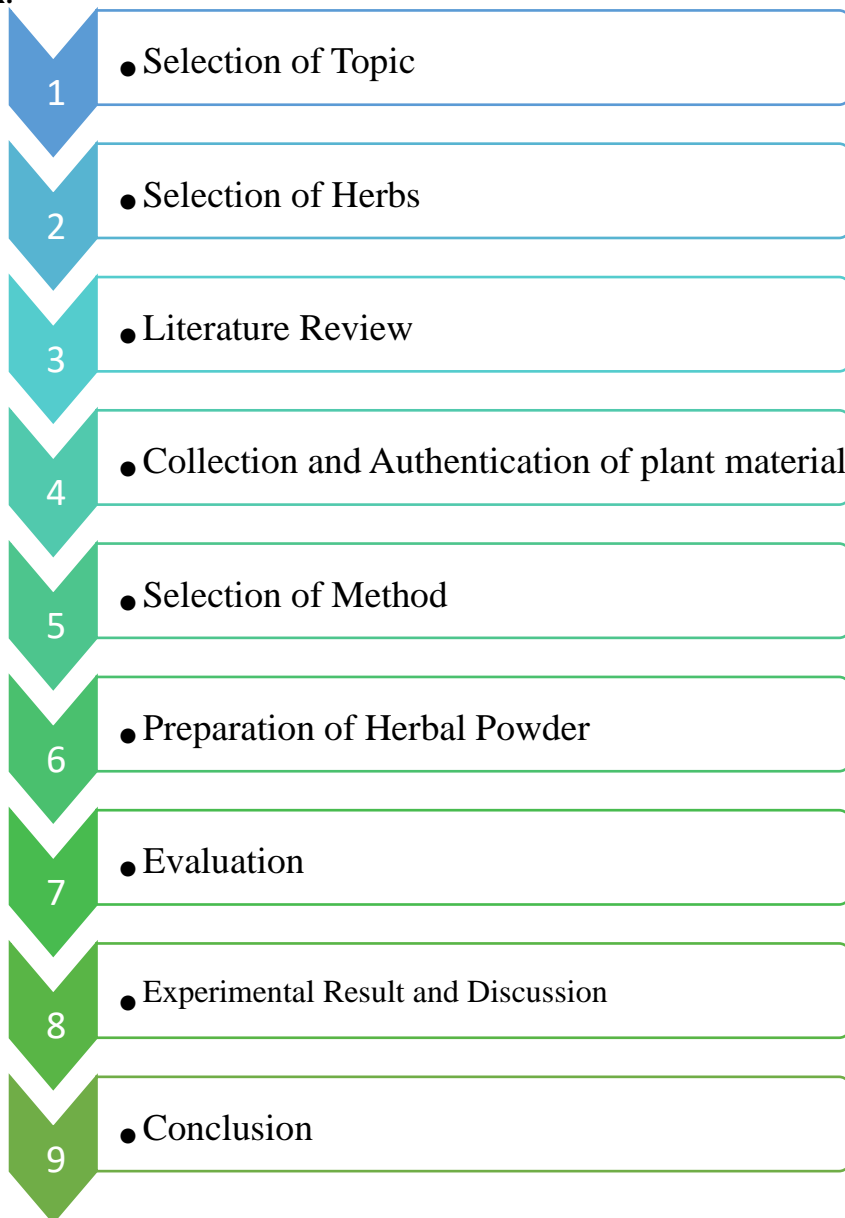
Objective:

- To evaluate the safety, efficacy and quality of polyherbal scrub.
- To evaluate the cleansing, nourishing ability of polyherbal scrub.
- To formulate and evaluate a cosmetic polyherbal scrub for glowing skin by using natural herbal ingredients.
- To overcome the skin problems by using herbal ingredients.
- To get proper effect of herbal formulation.
- To reduce facial problems.
- To reduce the side effects after using chemical facial formulations.
- To increase the maximum use of naturally occurring herbal ingredients.
- To minimize the use of chemical products.



Fig10. Formulation of

Plan of Work:



Material and methods:

All the natural materials using Reetha, Amla, Neem, Sandalwood, Turmeric, and Orange Peel used in the

study were purchased from the local market, in a dried powder form. The details of the plant material used in the formulation are mentioned in Table .

Material:

Sr.No.	Ingredient	uses
1	Reetha Powder	Cleansing Agent
2	Amla Powder	Anti-Ageing Agent
3	Neem Powder	Anti-septic Agent
4	Sandalwood Powder	Exfolient

5	Turmeric Powder	Anti-Inflammatory Agent
6	Orange Peel Powder	Anti-Oxidant
7	Aloevera Gel	Anti-Spasmodic
8	Xanthan Gum	Hydrating Agent
9	Rose Water	Cooling Effect
10	Tea Tree Oil	Anti-bacterial Agent

Methods:

1. Collection and Preparation of Raw Materials

- Fresh herbs (e.g., neem leaves, orange peel) were collected from local sources.
- The plant materials were washed thoroughly with distilled water to remove dirt and impurities.
- All materials were shade-dried for 5–7 days to preserve active constituents.
- Dried materials were ground separately into fine powders using a mechanical grinder and sieved through an 80-mesh sieve.

2. Formulation of the Scrub

- Equal quantities (e.g., 5g each) of the herbal powders (Neem, Turmeric, Orange Peel) were mixed uniformly.
- An exfoliating agent such as walnut shell powder was added to the mix (typically 10–20% of total weight).
- A small quantity of a natural binder and humectant such as aloe vera gel was added to convert the dry mix into a soft paste.
- Rose water or distilled water was added gradually to achieve the desired consistency for application.

3. Homogenization

- The mixture was blended thoroughly using a spatula or mixer to ensure uniform distribution of all components.
- The final formulation was stored in airtight, sterilized glass containers.

4. Evaluation

- The prepared scrub was evaluated for:

- Organoleptic properties: color, odor, texture
- pH value: using digital pH meter (1% aqueous solution)
- Spreadability: measured using a glass slide method
- Stability: monitored over 30 days at room temperature for any changes in texture, color, or odor.

Procedure:

Firstly collect all essential glassware's, apparatus

- Clean and dry it properly.
- Sieve reetha powder, Amla powder, neem powder, xanthan gum and turmeric powder from mesh no. # 60 separately.
- Sieve Sandalwood Powder from mesh no. # 20.
- Take Accurately Weigh quantity of all sieved ingredient separately.
- Take mortar and pastel, add reetha powder glycerine in it .
- Add Amla powder, neem powder, Orange Peel Powder, xanthan gum, turmeric powder.
- Triturate and mix it uniformly.
- Then add Sandalwood powder, rose water in it and mix it well & add preservative.
- Collect it in proper container.
- Perform evaluation tests for it.
- Label it properly.^{[2][3][4]}

Sr.No.	Ingredient	Quantity	Uses
1.	Reetha powder	25gm	Cleansing Agent
2.	Amla Powder	10gm	Anti-Ageing agent
3.	Neem Powder	05gm	Anti-Septic Agent
4.	Orange Peel Powder	05gm	Anti-Oxidant

5.	Sandalwood Powder	02gm	Exfollient
6.	Xanthan Gum	02gm	Thickening agent
7.	Turmeric	01gm	Anti- Inflammatory Agent
8.	Tea tree Oil	0.5 %	Preservative
9.	Glycerine	2.5ml	Humectant
10.	Rose Water	QS	Solvent

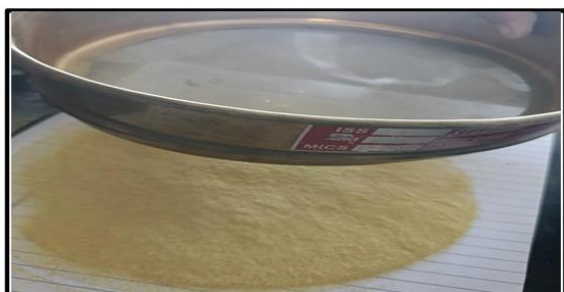


Fig:13 Sieving of Powder



Fig 14. Triturating of Powders

d) Evaluation Parameters:

Following are the evaluation parameters were performed to ensure superiority of prepared Polyherbal Scrub. ^{[1][2][3]}

1. Colour: It was observed visually.
2. Odour: It was observed visually.
3. Texture: Appearance: It was observed visually.
4. Nature: It was observed visually.
5. Consistency: It was observed visually.
6. Angle of repose: The flow properties of Powders were studied by measuring Angle of Repose. It was determined by funnel method. Height of granules forming cone (h) and Radius of the base circle r was measured. The angle of repose was calculated as follows:

$$\text{Angle of repose } (\theta) = \tan^{-1} \left(\frac{h}{r} \right)$$

Angle of Repose	Flow Property	Interpretation
25-30	Good	Acceptable
30-40	Passable	Moderate
>40	Poor	Bad

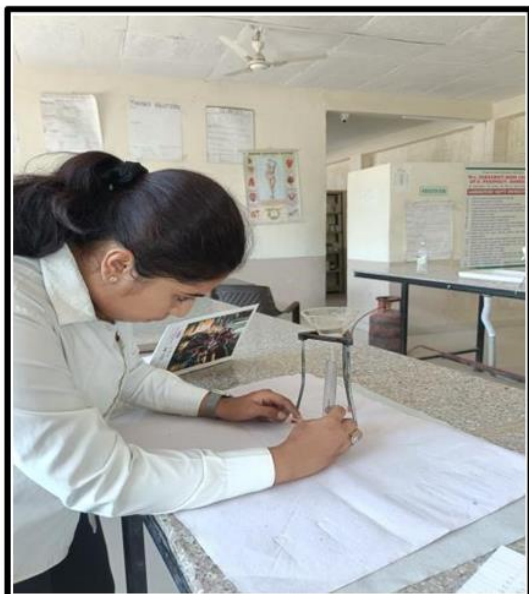


Fig 15. Checking of Angle of repose



Fig 16. Angle of repose Setup

7. Bulk density: Bulk volume was measured after manually tapping the cylinder two times on a flat table top surface.

$$\text{Bulk Density} = \frac{\text{Weight (W)}}{\text{Volume (V1)}}$$



Fig 17 .Bulk Density

8) Tapped density: Tapped Volume was measure with tapping for 100 times on flat table top surface

$$\text{Tapped Density} = \frac{\text{Weight (W)}}{\text{Volume (V2)}}$$

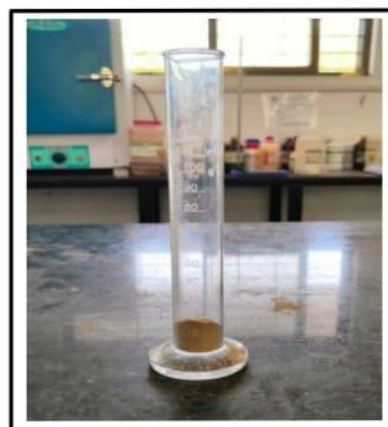


Fig 18. Tapped Density

9) Carr's Index: The bulk and tapped densities were used to calculate Carr's Compressibility index to provide measure of the flow properties and compressibility of powder

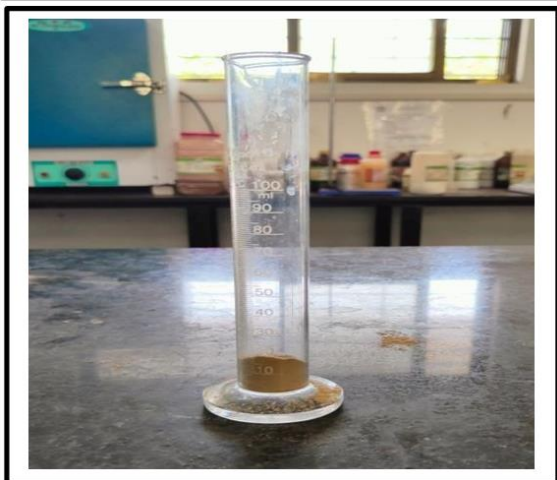
$$\text{Carr's Index (CI)} = \frac{\text{Tapped density} - \text{Bulk density}}{\text{Tapped density}} \times 100$$

10) Hausner ratio: It is indicative of flow properties. It is derived property from bulk and tapped density. Lower the Hausner ratio is indicating better flow

whereas higher ratio indicates poor flow of granules. It is calculated by the following formula.

$$\text{Hausner Ratio (HR)} = \frac{\text{Tapped Density}}{\text{Bulk Density}}$$

$$\text{Tapped Density} = \frac{\text{Weight (W)}}{\text{Volume (V2)}}$$



Hausners Ratio	Flow Properties	Interpretation
<1.25	Good	Ideal
1.25-1.5	Fair to passable	Acceptable
>1.5	Poor	Bad

11.pH: pH of the prepared Polyherbal scrub was evaluated by using pH paper.

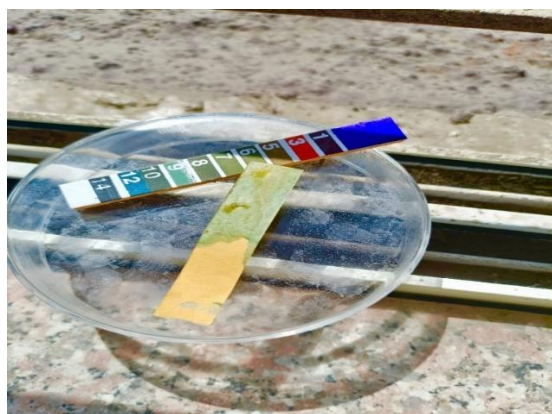


Fig. pH Test

12.Fomability: Small amount of scrub was shaken with water in measuring cylinder and foam was measured.



Fig 21. Foamability

14. Washability: Little quantity of scrub was applied over the skin and washed with water.
15. Nature of Skin After wash: After washing skin with water, it was checked that nature of skin and colour difference of skin.
- 16.Irritability: It was evaluated by Patch test. It is not verified test but as per mentioned on marketed preparations label, had performed this test also. Little quantity of the scrub was applied on the surface of skin and kept it as it is for few minutes.



Fig 22 Irritabilit test

16. Grittiness: Grittiness was checked manually
17. Cleansing effect: The preparation is checked for its cleansing effect by checking if it removes the dirt/grime when rubbed into the skin and then washed with water.



Fig 23 Cleansing Effect

19. Ease of use: It is determine that how easily users can use the product. We determined it by using the small amount of product as trial purpose.^{[1][2][3][4]}

Sr. no.	Tests	Results
1.	Colour	Brownish Green Colour
2.	Odour	Slightly Woody
3.	Texture/ Appearance	Smooth
4.	Nature	Solid
5.	Consistency	Good
6.	Angle of repose	Good
7.	Bulk density	Good
8.	Tapped density	Good
9.	Carr's Index	Good
10.	Hausner ratio	Good
11.	pH	7
12.	Foamability	Adequate
13.	Washability	Easily washable
14.	Nature of Skin After wash	Smooth
15.	Irritability	Non irritant
16.	Cleaning effect	Good
17.	Ease of use	Yes

Table No. 5 Evaluation Table

Results and Discussion :

The formulated herbal scrub was evaluated at different parameters. All the organoleptic properties were checked visually such as colour, odour, consistency, homogeneity and texture. As a result, the colour observed was Desert Colour, no bad smell occurred from formulation and the consistency of the formulation was found suitable as required to apply on skin. Sandalwood particles used were checked for their texture. The homogeneity of preparation was checked on skin and was found to be good and satisfactory. Washability and cleansing properties of Reetha was found to be good, and it is easily removed by washing with normal water. It left a smooth feel on the skin after washing and no dryness was observed. Spreadability quality was also tested with the help of glass plates and found that the preparation had good consistency and was easily spreadable when compared with a marketed gel based scrub. No irritation, redness or any dermatological effects were observed on skin during irritancy testing.^[6]

Conclusion:

From the above results, it is concluded that the prepared herbal based scrub formulation can be safe to use and reetha used as a cleansing agent shows good cleansing effect. As most of the ingredients used are natural ingredients, so chances for side effects/irritation are less. The prepared scrub 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. Since, Amla is a natural anti-aging and anti-wrinkle agent and neem which is an antibacterial, anti-inflammatory and antiseptic agent, they are both incorporated into the formulation which increases the efficiency of the product.

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 reasons for 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 are ineffective or may cause harmful effects. The use of polyherbal face scrub gives effectiveness and healthier skin type. The antioxidant, antiseptic,

anti aging effect of fenugreek, turmeric and amla 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.

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