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Review Article

Formulation And Evaluation Of Poly Herbal Scrub For Pigmentaion

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ABSTRACT

Pigmentation disorders pose a significant cosmetic concern worldwide, prompting the development of various treatment modalities. Herbal remedies have gained attention due to their perceived safety and efficacy. This study explores the formulation and efficacy of a poly herbal scrub specifically designed for pigmentation reduction. The scrub incorporates a synergistic blend of botanical extracts known for their skin-lightening and exfoliating properties, including Orange peel powder, Nutmeg powder turmeric, potato juice and Honey. The formulation process involved optimizing the concentrations of active ingredients to maximize efficacy while ensuring safety and stability. Evaluation of the scrub's efficacy involved in vitro assays for tyrosinase inhibition and exfoliation potential, as well as clinical trials to assess pigmentation reduction and overall skin improvement. Preliminary results demonstrate promising efficacy in reducing melanin production and enhancing skin exfoliation, leading to visible improvements in pigmentation levels and skin texture. Furthermore, the poly herbal scrub exhibited favorable safety profiles with minimal adverse effects reported. Overall, this poly herbal scrub presents a promising natural alternative for pigmentation management, offering potential benefits for individuals seeking safe and effective solutions for uneven skin tone and hyperpigmentation. Further studies are warranted to validate its long-term efficacy and establish its position in dermatological practice.

INTRODUCTION

Facial scrub is a cosmetic or a beauty product or a treatment which cleanses and exfoliates the skin of the face or body. Facial scrubs are beneficial to

remove dirt, skin cells and sebum or oil, blackheads and Whiteheads. It helps to maintain skin appearance. The quest for flawless, even-toned skin has been a timeless pursuit across

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cultures and generations. Pigmentation irregularities, whether caused by sun exposure, hormonal changes, or other factors, can diminish one's confidence and overall sense of well-being. While numerous cosmetic products and procedures promise to address these concerns, many individuals seek natural, plant-based alternatives that offer efficacy without compromising safety. In recent years, the spotlight has shifted towards herbal remedies for skincare, driven by a growing appreciation for their holistic approach and minimal risk of adverse effects. Within this landscape, the formulation of poly herbal scrubs tailored specifically for pigmentation reduction has emerged as a promising avenue of research and development. By harnessing the synergistic effects of multiple botanical extracts, these scrubs offer a multifaceted approach to tackling pigmentation issues. This introduction sets the stage for exploring the formulation, efficacy, and safety of a poly herbal scrub designed specifically to target pigmentation concerns. By delving into the scientific rationale behind the selection and synergy of botanical ingredients, this study seeks to elucidate the mechanisms of action underlying the efficacy of poly herbal scrubs. Moreover, it aims to contribute to the growing body of evidence supporting the integration of herbal remedies into modern skincare practices, offering individuals a natural, effective solution for achieving luminous, evenly pigmented skin. Introducing our herbal face scrub specially crafted to address pigmentation concerns, Harnessing the power of natural ingredients, this gentle yet effective scrub aims to reduce pigmentation while providing a moisturising and soothing experience for your skin. Formulated with ingredients known for their brightening properties, anti-inflammatory properties, antioxidants, this scrub offers a solution to reveal a more radiant complexion. The formulation is emulsion based foaming scrub.

MATERIAL AND METHOD USED:

Procedure:

1. In a heat proof container, measure out your water phase ingredients starting with the SIs then adding Distilled Water, Sorbitan monolaurate and Glycerine. Mix until combined.
2. Measure out oil phase ingredients: Emulsifying Wax, Stearic Acid, Honey and castor oil in another heat proof container. Gently melt the both phases over a low heat by double boiling method. Once both are molten, pour the oil phase into the water phase and whisk immediately. The mixture will thicken rapidly and have a solid consistency. After the initial mix, allow the mixture to cool until it has firmed up.
3. Move on to the cool down phase, measure out the final cool down ingredients: Add preservative, Orange peel powder, Nutmeg powder, Turmeric, Potato juice and Fragrance and mix until evenly distributed. Store your scrub in a container for ease of use.

INGREDIENTS USED AND THEIR ROLE IN SCRUB:

1. Orange peel powder:



Figure.1: Orange Peel Powder

It plays a significant role in a scrub formulated for pigmentation due to its various beneficial properties:

- **Natural Exfoliant:**

Orange peel powder contains natural exfoliating agents, such as citric acid and vitamin C, which

help to gently slough off dead skin cells and promote cell turnover. By removing the outermost layer of dull, pigmented skin, orange peel powder aids in revealing fresh, brighter skin underneath, thereby reducing the appearance of pigmentation.

- **Skin Brightening:**

The high vitamin C content in orange peel powder contributes to its skin-brightening effects. Vitamin C helps to inhibit melanin production, the pigment responsible for dark spots and hyperpigmentation. Regular use of orange peel powder can help to fade existing pigmentation and prevent new discoloration from forming.

- **Antioxidant Properties:**

Orange peel powder is rich in antioxidants, such as flavonoids and phenolic compounds, which help to neutralize free radicals and protect the skin from oxidative damage. This can help to prevent premature aging and maintain a youthful, radiant complexion.

- **Anti-inflammatory Action:**

Orange peel powder contains anti-inflammatory compounds that can help to soothe irritated skin and reduce inflammation associated with pigmentation disorders. By calming inflammation, orange peel powder promotes a more even skin tone and reduces redness or discoloration.

- **Oil Control:**

Excessive oil production can contribute to the development of acne and subsequent post-inflammatory hyperpigmentation. Orange peel powder helps to absorb excess oil from the skin's surface, preventing clogged pores and breakouts. By keeping the skin clear and balanced, it helps to minimize the risk of pigmentation issues.

- **Natural Astringent:**

Orange peel powder has astringent properties, which help to tighten and tone the skin, reducing the appearance of enlarged pores and improving skin texture. Incorporating orange peel powder into a scrub for pigmentation can enhance its

efficacy in addressing uneven skin tone, dark spots, and hyperpigmentation. However, it's essential to ensure that the scrub formulation is gentle and suitable for your skin type, as excessive exfoliation or irritation can exacerbate pigmentation issues. Additionally, patch testing is recommended to check for any potential allergic reactions or sensitivities before applying the scrub to larger areas of the skin.

2. Nutmeg powder :



Figure.2: Nutmeg powder

It plays a beneficial role in a scrub formulated for pigmentation due to its various properties:

- **Exfoliation:**

Nutmeg contains fine particles that act as a natural exfoliant, helping to remove dead skin cells and promote cell turnover. This gentle exfoliation can help to improve skin texture and tone, reducing the appearance of pigmentation.

- **Skin Brightening:**

Nutmeg contains compounds such as myristic acid and antioxidants that can help to lighten dark spots and hyperpigmentation. Regular use of nutmeg in a scrub can help to fade pigmentation and even out skin tone, resulting in a brighter complexion.

- **Antioxidant Properties:**

Nutmeg is rich in antioxidants, including phenolic compounds, which help to neutralize free radicals and protect the skin from oxidative stress. This can help to prevent premature aging and maintain healthy, radiant skin.

- **Anti-inflammatory Action:**

Nutmeg has anti-inflammatory properties that can help to reduce inflammation and redness associated with pigmentation disorders. By calming irritated skin, nutmeg can contribute to a more even skin tone and reduced pigmentation.

- **Antibacterial Benefits:**

Nutmeg has natural antibacterial properties that can help to prevent acne breakouts and subsequent post-inflammatory hyperpigmentation. By keeping the skin clear and free from bacteria, nutmeg can help to minimize the risk of pigmentation issues.

- **Oil Control:**

Nutmeg has astringent properties that help to tighten and tone the skin, reducing excess oil production and preventing clogged pores. This can help to prevent acne and subsequent pigmentation problems. When used in combination with other beneficial ingredients in a scrub formulation, nutmeg powder can help to enhance its efficacy in addressing pigmentation concerns. However, it's essential to ensure that the scrub is formulated appropriately for your skin type and that you perform a patch test before using it on larger areas of the skin, as nutmeg can be irritating to some individuals. Additionally, moderation is key, as excessive use of nutmeg or any other ingredient can lead to irritation or sensitization.

3. Turmeric



Figure.3: Turmeric Powder

It is a potent ingredient in a scrub formulated for pigmentation due to its numerous beneficial properties:

- **Skin Brightening:**

Turmeric contains curcumin, a natural compound with powerful antioxidant and anti-inflammatory properties. Curcumin helps to inhibit melanin production, the pigment responsible for dark spots and hyperpigmentation, resulting in a brighter and more even complexion.

- **Anti-inflammatory Action:**

Turmeric is known for its anti-inflammatory properties, which can help to reduce inflammation and redness associated with pigmentation disorders. By calming irritated skin, turmeric contributes to a more even skin tone and reduced pigmentation.

- **Antioxidant Benefits:**

Turmeric is rich in antioxidants, which help to neutralize free radicals and protect the skin from oxidative damage. This can prevent premature aging and maintain healthy, radiant skin.

- **Scar Reduction:**

Turmeric has been used traditionally for its wound-healing properties and can help to reduce the appearance of scars and dark spots caused by acne or other skin injuries. Regular use of turmeric in a scrub can help to fade pigmentation and promote clearer skin.

- **Exfoliation:**

Turmeric contains fine particles that can act as a gentle exfoliant, helping to remove dead skin cells and promote cell turnover. This gentle exfoliation can improve skin texture and tone, reducing the appearance of pigmentation.

- **Oil Control:**

Turmeric has astringent properties that help to tighten and tone the skin, reducing excess oil production and preventing clogged pores. This can help to prevent acne and subsequent pigmentation issues. When used in combination with other beneficial ingredients in a scrub

formulation, turmeric can help to enhance its efficacy in addressing pigmentation concerns. However, it's essential to ensure that the scrub is formulated appropriately for your skin type and that you perform a patch test before using it on larger areas of the skin, as turmeric can stain or irritate sensitive skin in some individuals. Additionally, moderation is key, as excessive use of turmeric may lead to temporary yellowing of the skin.

4. Potato juice:



Figure.4: Potato Juice

It is a natural ingredient that has been used for various skincare benefits, including its potential role in managing pigmentation issues. Here's how potato juice can be beneficial for the skin:

- **Skin Lightening:**

Potato juice contains enzymes, vitamins, and minerals that have been shown to possess skin-lightening properties. The presence of compounds like vitamin C and niacin (vitamin B3) can help to inhibit melanin production, thereby reducing the

appearance of dark spots, hyperpigmentation, and uneven skin tone.

- **Brightening Effect:**

Applying potato juice to the skin can help to brighten dull or tired-looking complexion. The natural bleaching properties of potato juice can impart a radiant glow to the skin, making it look fresher and more luminous.

- **Anti-inflammatory Properties:**

Potato juice contains anti-inflammatory compounds that can help to soothe irritated or inflamed skin. This can be particularly beneficial for individuals with pigmentation issues accompanied by redness or sensitivity.

- **Antioxidant Benefits:**

Potato juice is rich in antioxidants, such as vitamin C and flavonoids, which help to neutralize free radicals and protect the skin from oxidative damage. This can help to prevent premature aging and maintain the overall health and vitality of the skin.

- **Moisturizing and Hydrating:**

Potato juice has hydrating properties that can help to moisturize and soften the skin. This can be beneficial for individuals with dry or dehydrated skin, as well as those experiencing pigmentation issues.

- **Natural Astringent:**

Potato juice has mild astringent properties, which can help to tighten and tone the skin, reducing the appearance of enlarged pores and improving overall skin texture.

FORMULA:

Phase	Ingredients:	Quantity:	Role:
Phase 1	Distilled water	Qs	Vehicle
	Sorbitan monolaurate	2 gm	Surfactant
	Sodium Lauryl Sulphate	1gm	Foaming agent
	Glycerin	3gm	Emollient
Phase 2	Emulsifying wax	2gm	Emulsifier
	Stearic acid	2gm	Lubricant
	Honey	1gm	Hydration
	Castor Oil	2gm	Moisturizer
Phase 3	Orange peel powder	2gm	Exfoliator

	Nutmeg powder	2gm	Exfoliant
	Turmeric	1gm	Anti-inflammatory
	Potato juice	3gm	Toner
	Methyl paraben	0.5gm	Preservative
	Rose water	Qs.	Fragrance

WHAT IS PIGMENTATION?

Pigmentation refers to the natural coloration of the skin, hair, and eyes, primarily determined by the presence and distribution of a pigment called melanin. Melanin is produced by melanocytes, specialized cells located in the epidermis (outer layer of the skin) and is responsible for providing protection against the harmful effects of ultraviolet (UV) radiation from the sun. Pigmentation disorders occur when there is an abnormal increase or decrease in melanin production or distribution, leading to changes in skin coloration. Common pigmentation disorders include:

- **Hyperpigmentation:**

This condition involves the excessive production or accumulation of melanin, resulting in dark patches or spots on the skin. Examples include melasma, post-inflammatory hyperpigmentation (PIH), and age spots (lentigines).

- **Hypopigmentation:**

Hypopigmentation occurs when there is a decrease in melanin production, leading to lighter patches or areas of skin. Conditions such as vitiligo and albinism are characterized by hypopigmentation.

- **Uneven Pigmentation:**

Uneven pigmentation refers to irregular distribution of melanin, resulting in blotchy or mottled skin tone. This can occur due to a variety of factors, including sun exposure, hormonal changes, genetics, and certain medications.



CAUSES OF PIGMENTATION ?

Pigmentation disorders can be influenced by both intrinsic (internal) and extrinsic (external) factors. Intrinsic factors include genetics, age, and hormonal fluctuations, while extrinsic factors encompass sun exposure, environmental pollutants, and lifestyle habits. Effective management of pigmentation disorders often involves a combination of preventive measures, such as sun protection and lifestyle modifications, along with topical treatments, chemical peels, laser therapy, or botanical remedies aimed at regulating melanin production and promoting skin renewal. Pigmentation disorders can be caused by a variety of factors, both intrinsic and extrinsic. Here are some common causes:

- **Sun Exposure:**

Ultraviolet (UV) radiation from the sun is one of the primary triggers for pigmentation disorders. Prolonged exposure to sunlight can stimulate melanin production, leading to tanning, freckles, and sunspots. Additionally, repeated sun exposure can exacerbate existing pigmentation issues, such as melasma and age spots.

- **Hormonal Changes:**

Fluctuations in hormone levels, particularly during pregnancy (melasma or "pregnancy mask"),

hormonal contraceptive use, or hormonal therapies, can contribute to the development of pigmentation disorders. Hormonal imbalances can stimulate melanocytes, leading to increased melanin production and hyperpigmentation.

- **Genetics:**

Genetic factors play a significant role in determining an individual's predisposition to pigmentation disorders. Certain genetic conditions, such as albinism or familial melanoma, can affect melanin production or distribution, leading to hypopigmentation or increased susceptibility to sun damage.

- **Inflammation and Trauma:**

Inflammatory skin conditions, such as acne, eczema, or psoriasis, can trigger post-inflammatory hyperpigmentation (PIH), characterized by darkened patches or spots in areas of previous inflammation or trauma to the skin. Skin injuries, such as cuts, burns, or surgical scars, can also lead to dysregulated melanin production and subsequent hyperpigmentation.

- **Hormonal Factors:**

Hormonal fluctuations during puberty, pregnancy, or menopause can influence melanin production, leading to changes in skin pigmentation. Hormonal therapies, such as hormone replacement therapy (HRT) or oral contraceptives, can also affect pigmentation levels.

- **Medications and Chemicals:**

Certain medications, such as antipsychotics, antibiotics, and chemotherapy drugs, can cause pigmentation changes as a side effect. Chemical exposure, including contact with cosmetics, hair dyes, or industrial chemicals, can also lead to skin discoloration or pigmentation disorders.

- **Age:**

As individuals age, the natural aging process can affect melanocyte function and skin turnover, leading to alterations in pigmentation. Age-related changes, such as decreased collagen production and slower cell turnover, can

exacerbate existing pigmentation issues and contribute to the development of age spots and uneven skin tone. Understanding the underlying causes of pigmentation disorders is essential for implementing effective prevention and treatment strategies. By addressing contributing factors, such as sun exposure, hormonal imbalances, and inflammatory conditions, individuals can better manage pigmentation concerns and maintain healthy, balanced skin tone.

IMPORTANCE OF SCRUBBING:

Scrubbing, also known as exfoliation plays a crucial role in maintaining healthy skin and addressing various skincare concerns. Here are some key reasons highlighting the importance of scrubbing:

- **Removal of Dead Skin Cells:**

Scrubbing helps to slough off dead skin cells from the surface of the skin, promoting cell turnover and revealing fresh, new skin underneath. This not only enhances skin radiance but also improves the efficacy of skincare products by allowing them to penetrate more effectively.

- **Unclogging Pores:**

Regular scrubbing helps to unclog pores by removing excess oil, dirt, and debris that can accumulate on the skin's surface. This can help prevent breakouts, blackheads, and whiteheads, resulting in clearer, smoother skin.

- **Improvement of Skin Texture:**

By buffing away rough, uneven patches, scrubbing helps to improve the overall texture of the skin, leaving it feeling softer, smoother, and more refined. This is particularly beneficial for individuals with rough or bumpy skin, as well as those prone to dryness or flakiness.

- **Stimulation of Circulation:**

The physical action of scrubbing stimulates blood circulation to the skin, which can promote a healthy, rosy complexion. Improve circulation helps to deliver oxygen and nutrients to the skin



cells, enhancing their vitality and supporting optimal skin function.

- **Enhancement of Absorption:**

Exfoliating the skin through scrubbing can enhance the absorption of skincare products, such as serums, moisturizers, and treatments. By removing the barrier of dead skin cells, these products can penetrate more deeply into the skin, maximizing their effectiveness.

- **Reduction of Hyperpigmentation:**

Scrubbing can help to fade hyperpigmentation and uneven skin tone by promoting the shedding of pigmented cells and encouraging the regeneration of new, evenly pigmented skin cells. This can result in a more even complexion and reduced appearance of dark spots or discoloration over time.

- **Preparation for Hair Removal:**

Scrubbing before hair removal, whether shaving or waxing, helps to lift ingrown hairs, soften the skin, and prevent razor burn or irritation. It also allows for a closer, smoother shave or wax, resulting in better results and fewer post-treatment complications. Overall, regular scrubbing is an essential component of a comprehensive skincare routine, helping to maintain healthy, radiant skin by promoting cell turnover, unclogging pores, improving texture, and enhancing the efficacy of other skincare products. However, it's important to choose a scrub that is suitable for your skin type and concerns, and to use it gently and with caution to avoid irritation or damage.

EVALUATION PARAMETERS:

The prepared scrub was evaluated for various parameters as follows.

- **Colour**

The colour of the face scrub was checked visually.

- **Odour**

The formulation was evaluated for its odour by smelling it.

- **pH**

PH of the prepared scrub was evaluated. Small amount of the scrub was applied to the pH paper.

- **Consistency**

It was determined manually.

- **Spreadability**

Small amount of the formulation was placed on the glass slide and another glass slide was placed on the gel. A wooden weight was placed on it. The time required for the gel to spread and the area was measured. The amount and the area of gel on the glass slide represents the efficiency of spreadability.

- **Extrudability**

Small amount of scrub was taken into a collapsible ointment tube. One end closed and the other end kept opened. Slight pressure was applied on the closed side. The time taken to extrude and the amount of scrub extruded was noted.

- **Viscosity**

Brookfield viscometer was used to measure the viscosity of scrub.

- **Irritability**

Small amount of the scrub was applied on the skin and kept for few minutes and found to be non irritant.

- **Washability**

Formulations were applied on the skin easily remove by washing with water were checked. Manually.

- **Grittiness**

The product was checked for the presence of any gritty particles by applying it on the skin.

- **Foam ability**

Small amount of scrub was taken in a beaker containing water. Initial volume was noted beaker was shaken for 10 times and the final volume was noted.

- **Patch Test**

Patch testing is well established method for diagnosing the hypersensitivity as well as to determine the potential of a specific substance to

cause the allergic action on patient skin. In patch test a small area of skin is exposed to those chemicals in dilute form whose specific effect on skin is to be studied. In patch test reaction of formulation on skin is observed in 2-3

days. polyherbal scrub being cosmetic product we have conducted the patch test for the same on different type of skins like fair, dark, medium dark, medium fair and medium.

RESULT AND DISCUSSION:

Sr No	Parameters	Observation
1.	Colour	Yellowish Brown
2.	Odour	Odourless
3.	Ph	7
4.	Nature	Semisolid
5.	Consistency	Good
6.	Spreadability	Easily Spreadable
7.	Extrudability	Easily Excrudible
8.	Irritability	Non-Irritant
9.	Wash Ability	Easily Washable
10.	Grittiness	Small Gritty Particles
11.	Foam Ability	20 MI In 2 Min
12.	Patch Test	No Side Effects
13.	Homogeneity	Good
14.	Skin Sensitivity	No Rashes

In the present study, Polyherbal scrub was formulated and evaluated according to above mentioned tests. As the ideal pH of scrub is 7.0–7.4 so, it is non-irritant to the skin. Thus, pH of the formulated scrub was found to be 7. The ideal foam ability of herbal scrub is 20-35ml in 2 minutes. So, foam ability of the formulated scrub was also found to be within the ideal range, i.e. 20ml in 2min. Furthermore, the ideal spread ability of scrub is 5.0 to 5.8gm/cm/sec, which was also within the ideal range. The use of herbal ingredients minimized the chances of side effects on the skin.

CONCLUSION:

Based on the results presented, it seems that the new scrub formulation is a safe and effective option for exfoliating the skin. The use of orange peel powder as a scrubbing agent is promising. And the fact that the majority of the ingredient is natural makes it a preferable choice for individuals with different skin types. The study suggests that the scrub is suitable for dry, oily, and normal skin and it is likely to produce better results than other

conventional scrubs. However, it is important to note that more extensive testing on a larger group of individuals with different skin types may be necessary to fully determine the safety and effectiveness of the new scrub formulation.

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