



INVESTIGATING GEL-BASED HERBAL SCRUBS FOR DERMATOLOGICAL BENEFITS

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Abstract : This paper explores the efficacy of gel-based herbal scrubs as a natural alternative to chemical-laden skincare products. Traditional scrubs often contain synthetic ingredients that may have adverse effects on the skin, including the risk of skin cancer. By contrast, herbal scrubs utilize natural ingredients known for their gentle exfoliating and nourishing properties. This study investigates the formulation and benefits of gel-based herbal scrubs, highlighting their potential to promote healthier skin without the harmful side effects associated with chemicals.

Introduction to Herbal Scrubs: Herbal scrubs have gained popularity in recent years due to their natural ingredients and gentle effects on the skin. Unlike chemical-based scrubs, which may contain harsh additives, herbal scrubs rely on botanical extracts and natural exfoliants.

Ingredients and Formulation: Gel-based herbal scrubs typically combine aloe vera gel with various herbal extracts such as neem, turmeric, and rosemary. These ingredients offer antibacterial, anti-inflammatory, and antioxidant properties, which help to cleanse, soothe, and rejuvenate the skin.

Benefits for Skin Health: Herbal scrubs offer numerous benefits for skin health, including gentle exfoliation, removal of dead skin cells, and improvement of skin texture. Additionally, the natural ingredients in herbal scrubs can help to alleviate common skin issues such as acne, inflammation, and dryness.

Avoiding Chemical Side Effects: Chemical ingredients commonly found in skincare products, such as parabens, sulfates, and synthetic fragrances, have been linked to various health concerns, including an increased risk of skin cancer. By choosing gel-based herbal scrubs, consumers can reduce their exposure to these potentially harmful chemicals.

Conclusion: In conclusion, gel-based herbal scrubs offer a natural and effective solution for maintaining healthy skin without the risk of chemical side effects. By harnessing the power of botanical ingredients, these scrubs provide a safe and gentle alternative to traditional skincare products.

By prioritizing natural ingredients and avoiding harmful chemicals, individuals can enjoy the benefits of beautiful, radiant skin while minimizing the risk of adverse health effects.

Keywords: Gel-Based Scrub, Herbal, Natural Scrub, skin beautification, exfoliation

I. INTRODUCTION

To investigate gel-based herbal scrubs for dermatological benefits, particularly in reducing the risk of cancer, it is essential to explore the efficacy and safety of natural ingredients used in these products. Herbal scrubs, like those containing grape seed residues or tea tree oil, have shown antioxidant properties and skin-rejuvenating effects. These natural plant-based scrubs are rich in active molecules like antioxidants and vitamins, which can help reduce skin aging and improve skin health. Additionally, tea tree oil, known for its antimicrobial properties, has been studied for its efficacy in treating various skin conditions and promoting wound healing.

When formulating gel-based herbal scrubs, it is crucial to consider the safety aspects. Studies have shown that herbal ingredients like tea tree oil can be effective in treating skin conditions with minimal adverse effects, making them a safer alternative to conventional products. Moreover, creating non-toxic body washes using natural ingredients like coconut oil, honey, and essential oils can further enhance the safety profile of skincare products.

In the context of reducing the risk of cancer, it is important to avoid harmful chemicals commonly found in skincare products, such as formaldehyde, triclosan, and parabens, which have been linked to health concerns including hormone disruptions. By opting for herbal and natural ingredients in gel-based scrubs, the potential exposure to carcinogenic substances can be minimized, thus contributing to a safer skincare regimen.

Investigating gel-based herbal scrubs for dermatological benefits involves exploring the efficacy of natural ingredients like grape seed residues and tea tree oil, understanding their safety profiles, and emphasizing the importance of using non-toxic formulations to reduce the risk of cancer. By prioritizing natural and herbal ingredients in skincare products, individuals can enjoy the dermatological benefits while minimizing potential health risks associated with synthetic chemicals.

THE SCIENCE OF EXFOLIATION

Exfoliation is a fundamental process in skincare that involves the removal of dead skin cells from the outermost layer of the epidermis, known as the stratum corneum. This process is essential for maintaining healthy, radiant skin as it helps unclog pores, improves skin texture, and promotes the regeneration of new skin cells. The benefits of exfoliation extend beyond aesthetic improvements, as it can also help reduce the risk of certain skin conditions and potentially contribute to a lower risk of cancer.

Traditional exfoliating methods often rely on harsh chemicals or abrasive particles, such as microbeads, which can cause irritation, inflammation, and even long-term damage to the skin. These harsh exfoliants disrupt the skin's natural barrier function, leading to increased sensitivity and a higher risk of infection. Moreover, the use of microbeads has been linked to environmental concerns due to their non-biodegradable nature and potential harm to aquatic ecosystems.

GEL-BASED HERBAL SCRUBS: A GENTLER APPROACH

In recent years, there has been a growing interest in more gentle and natural exfoliating alternatives, such as gel-based herbal scrubs. These formulations incorporate plant-derived ingredients that offer exfoliating properties while being gentle on the skin. Herbal scrubs often contain natural exfoliants like jojoba beads, rice powder, or bamboo extract, which provide a mild abrasive action without causing excessive irritation.

One of the key advantages of gel-based herbal scrubs is their ability to deliver additional benefits beyond exfoliation. Many herbal ingredients possess antioxidant, anti-inflammatory, and skin-rejuvenating properties. For instance, grape seed residues and tea tree oil have been studied for their potential to reduce skin aging, improve skin health, and treat various skin conditions. These natural ingredients are rich in active molecules like polyphenols, vitamins, and essential oils, which can contribute to a healthier and more radiant complexion.

REDUCING CANCER RISK THROUGH SAFER SKINCARE

When it comes to reducing the risk of cancer, it is crucial to minimize exposure to harmful chemicals commonly found in conventional skincare products. Many synthetic preservatives, fragrances, and other additives have been linked to hormone disruption, allergic reactions, and even carcinogenic effects. By opting for gel-based herbal scrubs formulated with natural and non-toxic ingredients, individuals can reduce their exposure to potentially harmful substances and promote a safer skincare routine.

Gel-based herbal scrubs offer a gentler and more natural approach to exfoliation, providing a range of dermatological benefits while minimizing the risk of skin irritation and environmental impact. By incorporating these products into a comprehensive skincare regimen, individuals can enjoy the advantages of exfoliation while contributing to a healthier and more sustainable future for their skin.

II. PREPARATION OF GEL-BASED HERBAL SCRUB

The preparation of a gel-based herbal scrub involves a precise combination of natural ingredients to provide exfoliation and skin nourishment. Below is a detailed scientific procedure for creating such a product:

The preparation of a gel-based herbal scrub involves a precise combination of natural ingredients to provide exfoliation and skin nourishment. Initially, a gel base is prepared by accurately measuring distilled water into a beaker, followed by the addition of carbopol, a gelling agent, which is stirred continuously until a gel matrix forms. Benzoic acid, a preservative, is then added to prevent microbial growth, while xanthan gum, a thickening agent, is incorporated to enhance the gel's consistency. Propanediol, a humectant, is also added to enhance moisturization.

Next, a blend of natural exfoliants, including walnut shell powder, cinnamon powder, and rice powder, is added to the prepared gel base. Honey, a natural humectant, is incorporated into the mixture to provide moisturizing properties. Sandalwood powder, neem powder, and turmeric powder are also added, providing anti-inflammatory, antibacterial, and antioxidant benefits, respectively. Sodium cocoyl isethionate, a mild surfactant, is incorporated into the gel to enhance its cleansing properties.

To use the gel-based herbal scrub, a small amount is applied to damp skin and gently massaged in a circular motion. The scrub is allowed to exfoliate the skin effectively before rinsing off with warm water. This scrub is designed to help in the exfoliation and rejuvenation of the skin, promoting a smoother and healthier complexion.

Prior to regular use, it is crucial to conduct a patch test on a small area of skin to check for any allergic reactions or sensitivities to the ingredients. Monitoring for any adverse reactions is essential to ensure the product is well-tolerated by the skin and does not cause any unwanted side effects. By following this scientific method of preparation and usage, gel-based herbal scrubs can offer a gentle yet effective exfoliation experience while providing nourishment and rejuvenation to the skin. It is important to adhere to proper formulation techniques and safety precautions to maximize the benefits of such skincare products.

TABLE 1: Composition

Sr.No.	Common Name	Category	Quantity
1	Walnut Shell	Anti-aging, anti-oxidant	2
2	Cinnamon	Anti-bacterial	2
3	Rice powder	Improves anti-bacterial complexation	3
4	Honey	Antiseptic, antioxidant	4
5	Sandalwood	Smoothing, cooling effect and improves fairness	1
6	Neem	Skin conditioner, antiseptic	0.5
7	Turmeric	Antiseptic, improve fairness	0.5
8	Carbopol	Gelling agent	2
9	Benzoic Acid	Preservative	0.1

10	Xanthan Gum	Neutralized	0.1
11	Propanediol	Moisturiser	2
12	Sodium Cocoyl Isethionate	Foaming agent	4
13	Distilled water	Vehicle	Qs

III. FORMULATION OF A GEL-BASED HERBAL SCRUB WITH NATURAL EXFOLIANTS

Ingredients:

1. Walnut Shell Powder (5-10% w/w): A natural exfoliant that gently removes dead skin cells.
2. Cinnamon Powder (1-2% w/w): Provides a warming sensation and has antimicrobial properties.
3. Rice Powder (2-5% w/w): A mild abrasive that helps exfoliate and brighten skin.
4. Honey (2-5% w/w): A humectant that moisturizes and nourishes the skin.
5. Sandalwood Powder (1-2% w/w): Possesses anti-inflammatory and skin-soothing properties.
6. Neem Powder (1-2% w/w): Known for its antibacterial and anti-fungal effects.
7. Turmeric Powder (0.5-1% w/w): Provides antioxidant and anti-inflammatory benefits.
8. Carbopol (0.5-1% w/w): A gelling agent that helps in the formation of a stable gel matrix.
9. Benzoic Acid (0.1-0.2% w/w): A preservative to prevent microbial growth.
10. Xanthan Gum (0.5-1% w/w): A thickening agent that enhances the consistency of the gel.
11. Propanediol (5-10% w/w): A humectant and solvent that helps in the incorporation of herbal extracts.
12. Sodium Cocoyl Isethionate (2-5% w/w): A mild surfactant that provides cleansing and foaming properties.
13. Distilled Water (q.s.): Used to adjust the final volume and consistency of the gel.

Formulation Process:

1. Prepare the herbal powder blend: Mix the walnut shell powder, cinnamon powder, rice powder, sandalwood powder, neem powder, and turmeric powder in a suitable container.
2. Prepare the gel base: Disperse carbopol in distilled water and allow it to hydrate for 30 minutes. Add benzoic acid and xanthan gum while stirring continuously until a clear gel forms.
3. Incorporate the herbal blend: Gradually add the herbal powder blend to the gel base, mixing thoroughly to ensure even distribution.
4. Add the humectants and surfactant: Mix propanediol and sodium cocoyl isethionate into the formulation, stirring until a homogeneous mixture is obtained.
5. Adjust the consistency: If needed, add distilled water to achieve the desired consistency of the gel-based herbal scrub.
6. Package and store: Transfer the formulation into suitable containers and store in a cool, dry place.

The prepared gel-based herbal scrub combines the exfoliating properties of walnut shell powder with the skin-beneficial effects of various herbal ingredients. The gel matrix provides a gentle and effective means of delivering the scrub to the skin, while the humectants and surfactant enhance the overall sensorial experience and cleansing properties of the formulation.

IV. EVALUATION OF GEL-BASED HERBAL SCRUB FORMULATION

The prepared gel-based herbal scrub was subjected to a comprehensive evaluation to assess its quality, safety, and performance characteristics. The following parameters were analyzed:

1. Appearance

The prepared scrub gel was visually inspected for its color, odor, and overall aesthetic appeal.

2. pH

The pH of the prepared gel was measured using a calibrated pH meter. A small amount of the gel was applied directly onto the pH electrode, and the reading was recorded.

3. Consistency

The consistency of the gel was determined by visual observation and manual assessment, categorizing it as solid, semi-solid, or liquid.

4. Spreadability

Two glass slides were taken, and a small amount of the gel was placed on one slide. Another slide was placed on top of the gel, and a wooden weight was applied. The time required for the gel to spread and the area covered were measured. The spreadability was calculated based on the amount and area of the gel spread, representing its efficiency.

5. Extrudability

A small amount of the gel was filled into a collapsible ointment tube with one end closed and the other end open. Slight pressure was applied on the closed side, and the time taken to extrude the gel and the amount extruded were noted.

6. Viscosity

A Brookfield viscometer was used to measure the viscosity of the gel formulation at a specific temperature and shear rate.

7. Irritability

A small amount of the gel was applied to the skin and observed for any signs of irritation or adverse reactions. The formulation was deemed non-irritant if no visible reactions occurred.

8. Washability

A small quantity of the gel was applied to the skin and washed with water to assess its ease of removal. Formulations that can be easily removed by washing with water were tested manually.

9. Grittiness

The formulation was checked for the presence of any gritty particles by applying it to the skin and assessing its texture.

10. Foamability

A small amount of the gel was shaken with water in a graduated measuring cylinder, and the initial and final volumes of the foam were noted after 10 shakes.

11. Patch Test

A patch test was conducted to assess the potential for hypersensitivity reactions and to determine the formulation's safety on the skin. A small amount of the gel was applied to a specific area of the skin, and the reaction was observed over 2-3 days.

12. Stability Study

The stability of the formulation was evaluated by filling the scrub into plastic containers and placing them in a humidity chamber at 45°C and 75% relative humidity. The stability was inspected for 3 months at intervals of one month each, assessing parameters such as appearance, pH, consistency, and performance characteristics.

By conducting these comprehensive evaluations, the quality, safety, and efficacy of the gel-based herbal scrub formulation were assessed, ensuring that it meets the desired standards for skincare applications.

V. RESULTS AND DISCUSSION

The gel-based herbal scrub was successfully formulated using a simple preparation method. The results of the various evaluations conducted on the prepared formulation are as follows:

Table 2: Evaluation of herbal scrub of walnut shell

S.NO.	PARAMETERS	INITIAL	AFTER 1 MONTH	AFTER 2 MONTHS	AFTER 3 MONTHS
1	Color	Brown	No Change	No Change	No Change
2	Odor	Characteristic	No Change	No Change	No Change
3	Consistency	Good	No Change	No Change	No Change
4	pH	6.8	6.7	6.6	6.5
5	Viscosity	1.4 poise	1.4 poise	1.3 poise	1.2 poise
6	Spreadability	5.72 g.cm/sec	5.72 g.cm/sec	5.71 g.cm/sec	5.7 g.cm/sec
7	Washability	Easily washable	Easily washable	Easily washable	Easily washable
8	Grittiness	Small gritty particle	Small gritty particle	Small gritty particle	Small gritty particle
9	Foaming ability	100 ml at 5 min	100 ml at 5 min	100 ml at 5 min	100 ml at 5 min
10	Irritability	Non-irritant	Non-irritant	Non-irritant	Non-irritant
11	Extrudability	Easily extruded	Easily extruded	Easily extruded	Easily extruded
12	Patch Test	Non-allergic	Non-allergic	Non-allergic	Non-allergic

Appearance and Consistency

The prepared herbal scrub exhibited a soft, smooth texture and a pleasant fragrance. Visual observation and manual assessment confirmed that the formulation had a semi-solid consistency, suitable for application on the skin.

Spreadability

The spreadability test revealed that the herbal scrub had good spreadability, allowing for easy and comfortable application on the skin. The time required for the gel to spread and the area covered were within the acceptable range, indicating efficient spreadability characteristics.

pH

The pH of the formulation was found to be within the physiologically acceptable range for topical application, ensuring compatibility with the skin's natural pH and minimizing the risk of irritation.

Viscosity

The viscosity of the herbal scrub, as measured by the Brookfield viscometer, was within the desired range, providing optimal consistency for application and ensuring that the formulation maintains its structure during storage and use.

Extrudability

The extrudability test demonstrated that the herbal scrub could be easily extruded from the collapsible ointment tube, with a consistent amount being expelled upon the application of slight pressure.

Irritability and Washability

The formulation was found to be non-irritant upon application to the skin. The herbal scrub could be easily removed by washing with water, ensuring convenient and effective cleansing after use.

Foamability

The foamability test showed that the herbal scrub produced a moderate amount of foam when shaken with water, indicating its ability to provide a pleasant cleansing experience.

Patch Test

The patch test results confirmed that the herbal scrub did not cause any adverse reactions or hypersensitivity on the skin, further supporting its safety for topical application.

Stability Studies

The stability studies conducted over a period of 3 months at 45°C and 75% relative humidity demonstrated that the herbal scrub maintained its quality, consistency, and performance characteristics throughout the evaluation period. The results are summarized in the table below.

The results demonstrate that the gel-based herbal scrub formulation exhibits desirable characteristics, including good spreadability, optimal viscosity, and acceptable pH, making it suitable for topical application. The stability studies confirm the formulation's ability to maintain its quality and performance over time, ensuring its effectiveness and safety for use.

KEY BENEFITS OF GEL-BASED HERBAL SCRUBS

Gel-based herbal scrubs offer several advantages over traditional exfoliating products, making them a popular choice for those seeking a natural, gentle, and effective skincare routine.

1. Natural Ingredients

Gel-based herbal scrubs are formulated with natural ingredients, free from harsh chemicals, parabens, sulfates, and synthetic fragrances, reducing the risk of skin irritation and promoting a safer, more eco-friendly skincare option.

2. Gentle Exfoliation

The gel texture of these scrubs ensures a gentle exfoliation process, making them ideal for individuals with sensitive skin who require a more delicate approach to skin cleansing.

3. Hydration

Many gel-based herbal scrubs contain moisturizing ingredients, which help lock in the skin's natural moisture, leaving it feeling soft and hydrated after exfoliation.

4. Skin Rejuvenation

Herbal extracts in these scrubs are rich in antioxidants, which can help rejuvenate the skin, reduce inflammation, and promote an even skin tone.

How to Use Gel-Based Herbal Scrubs

Using a gel-based herbal scrub is a straightforward process:

1. Preparation: Start with clean, damp skin.
2. Application: Take a small amount of the scrub and gently massage it onto your face or body using circular motions.
3. Gentle Exfoliation: Be gentle and avoid scrubbing too vigorously, especially on sensitive areas like the face.
4. Rinsing: Rinse thoroughly with lukewarm water.
5. Moisturizing: Pat your skin dry and follow up with your favorite moisturizer.

Advantages of Gel-Based Herbal Scrubs over Powder-Based Herbal Scrubs

Gel-based herbal scrubs offer several advantages over powder-based herbal scrubs:

1. Convenience: Gel-based scrubs are pre-mixed and ready to use, making them more convenient for those who prefer a quick and easy skincare routine.
2. Hydration: Gel scrubs often contain moisturizing ingredients, helping to hydrate the skin while exfoliating, which can be beneficial for individuals with dry or sensitive skin.
3. Controlled Texture: Gel scrubs offer a consistent texture, ensuring even and gentle exfoliation, suitable for people with varying skin types.
4. Easy Application: Gel-based scrubs are easy to apply and spread across the skin, reducing the risk of uneven exfoliation or abrasion.
5. Less Mess: They are generally less messy than powder-based scrubs, as there's no need to mix the product with water before application.

While gel-based herbal scrubs offer several benefits, the choice between gel-based and powder-based scrubs ultimately depends on individual preferences and skin type. Some may prefer powder-based scrubs for their longer shelf life and customization options. It's essential to consider your skin's specific needs and your personal skincare routine when selecting a scrub type.

CONCLUSION

Gel-based herbal scrubs have emerged as a sought-after solution in the beauty industry, offering a natural, gentle, and effective approach to skin exfoliation and rejuvenation. These products reflect the increasing demand for eco-friendly and natural skincare alternatives that prioritize skin health while promoting environmental sustainability.

The rise of gel-based herbal scrubs signifies a shift towards skincare products that harness the power of botanical ingredients to deliver optimal results without compromising on safety or efficacy. By incorporating these gentle exfoliants into your skincare routine, you can experience the benefits of natural ingredients that nourish and revitalize your skin.

As you navigate the realm of skincare, consider incorporating gel-based herbal scrubs into your regimen. Their botanical extracts, gentle exfoliating properties, and moisturizing benefits offer a holistic approach to skincare that may unveil the beauty secret you've been seeking. Embrace the inherent power of nature, and witness your skin radiate with the glow of health and vitality, reflecting a harmonious balance between beauty and well-being.

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