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RESEARCH ARTICLE

Formulation and Characterization of Herbal Face Pack

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Abstract: This research focuses on formulating and examining a natural herbal face pack designed to enhance skin radiance while addressing various skin concerns such as redness, aging, tanning, acne, scars, and wrinkles. The face pack comprises a blend of natural ingredients known for their skin-nourishing properties, including hibiscus powder, tulsi, turmeric, sandalwood, ashwagandha, rose petals, and rice flour powder. These ingredients, sourced in dried powder form from local markets, are carefully measured and finely ground to ensure uniformity using a sieve. Following this, a meticulous process of geometric mixing through serial dilution is employed to achieve a consistent and homogeneous mixture. The study encompasses thorough assessments of different factors including sensory properties, physicochemical parameters, stability, and irritation testing to ensure the effectiveness and safety of the face pack formulation. The primary objective of herbal face packs is to alleviate common skin issues such as dark circles, acne, and scars by enhancing and regulating blood circulation, thereby promoting healthier skin appearance and cleansing pores from impurities. Additionally, the face pack is fortified with essential vitamins crucial for maintaining vibrant and glowing skin. This research emphasizes the significance of utilizing natural ingredients to develop skincare products that not only enhance aesthetic appeal but also promote skin health and vitality.

Keywords: Natural ingredients; Face pack; Sandalwood; Cosmetics; Formulation.

1. Introduction

Cosmetics encompass a wide array of materials intended for application on the human body to cleanse, beautify, and enhance attractiveness. Among the various parts of the body, the facial skin serves as a prominent indicator of an individual's overall health and well-being. Maintaining vibrant, radiant, and healthy facial skin necessitates a well-balanced diet rich in essential nutrients such as proteins, vitamins, amino acids, lipids, and carbohydrates. In recent times, herbal cosmetics have garnered widespread attention for their ability to brighten, nourish, and cleanse the skin effectively. Their rising popularity can be attributed to the perceived purity they offer, along with the reduced risk of adverse effects on human health compared to traditional cosmetics, which often contain synthetic or chemical compounds. [1,2]

Vitamins, known for their pivotal role in maintaining vibrant and healthy skin, hold significant importance in the formulation of herbal face packs. By integrating these essential nutrients into natural skincare products, their capacity to promote skin vitality and radiance is further augmented. This study aims to develop and evaluate herbal face pack tailored specifically for cosmetic application. The chosen ingredients are commonly found in kitchen pantries, making the formulation process accessible and practical for everyday consumers. These natural components boast a myriad of benefits for the skin, including hydration, rejuvenation, and fortification against environmental stressors. Their use in skincare routines offers a holistic approach to nurturing the skin, addressing various concerns while maintaining its health and resilience. One of the notable advantages of natural face packs is their simplicity and ease of preparation and application. This makes them a convenient option for individuals seeking effective skincare solutions without the complexity associated with elaborate beauty regimens. To sustain the desired glow and reap the full benefits, regular use of these face packs is recommended, typically several times a week. While the effects may be temporary, consistent application ensures ongoing nourishment and enhancement of skin health over time [3, 4]

2. Materials and Methods

2.1. List of herbal ingredients

The herbal ingredients used in the study are listed out in Table 1.

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Table 1. List of herbal ingredients used in the study

Sl. no.	Common Name	Figure	Category
1	**Hibiscus rosa sinesis** **Scientific name:** *Hibiscus rosa-sinensis* **Family name:** Malvaceae		It Improve Skin Elasticity, Moisture Booster, Natural Cleanser. Also,the antioxidants in hibiscus powder help to reduce skin irriation brought by acne and other skin issues. [2-5]
2	**Tulsi** **Scientific name:** *Ocimum tenuiflorum* **Family name:** Lamiaceae		Antibacterial, Antioxidant, Anti-inflammatory properties. Helps in healthy skin aging. Reduces Pigmentation. [2-5]
3	**Turmeric** **Scientific name:** *Curuma longa* **Family name:** Zingiberaceae		It delays the signs of aging like Wrinkles. It has antiseptic, antifungal, Anti-Inflammation, properties. It's Smoothens the skin. Improves skin brightness and tone[2-5]
4	**Sandalwood powder** **Scientific name:** *Santalum album* **Family name:** Santalaceae		It has anti-tanning properties. Enhances skin brightness. Skin softening effect, Pimple and acne treatment. It Improve skin color. [2-5]
5	**Ashwagandha** **Scientific name:** *Withania somnifera* **Family name:** Solanaceae		It treat pimple,acne and Reduce oil secretion. It's helps to moisturizes the Skin. Improves texture of the skin. [2-5]
6	**Rose petal powder:** **Scientific name:** *Rosa rubiginosa* **Famliy name:** Rosaceae		Rose petals have strong antibacterial qualities in addition to the health benefits of vitamins B, C, and K. It also contains a significant amount of antioxidants. It prevents fine lines and wrinkles. [2-5]
7	**Rice Flour:** **Scientific name:** *Oryza sativa* **Family name:** Gramineae		Diminishes oiliness. Antibacterial, Antifungal, Antioxidant, anti-aging properties. Brightens skin complexion. It absorbs excess oil. Improves skin texture. It prevent from sun damage. [2-5]

2.2. Method of preparation

The ingredients were accurately measured as per the quantities mentioned in Table 2 and sieved through #80 mesh. Subsequently, employing the serial dilution procedure, all components were combined geometrically to ensure homogeneity. The resultant face pack was then placed inside a self-sealing polyethylene bag for further evaluation. [6]

Table 2. Formulation table for the preparation of Herbal Face Pack

S. No.	Ingredient	Quantity (%) per formulation								
		S.B.1	S.B.2	S.B.3	S.B.4	S.B.5	S.B.6	S.B.7	S.B.8	S.B.9
1	Hibiscus	15	15	15	10	10	10	5	5	5
2	Tulsi	20	15	10	20	15	10	20	15	10
3	Turmeric	5	5	5	5	5	5	5	5	5
4	Sandalwood	35	35	35	35	35	35	35	35	35
5	Ashwaganda	5	5	5	5	5	5	5	5	5
6	Rose petals	10	10	10	10	10	10	10	10	10
7	Rice flour	10	15	20	15	20	25	20	25	30

2.3. Evaluation of herbal face pack

2.4. Organoleptic evaluation

Visual assessment of organoleptic characteristics, including color, odor, texture, and smoothness, was conducted. Physical qualities were manually evaluated for organoleptic indices. [7]

2.5. Physical evaluation

2.5.1 Bulk Density [BD]: Calculated as the ratio of total powder mass to bulk volume.
2.5.2 Tapped Density [TD]: Determined as the ratio of powder mass to tapped volume.
2.5.3 Angle of Repose: Calculated using the height and radius of the powder heap formed.
2.5.4 Hausner's Ratio: Defined as the ratio of tapped density to bulk density.
2.5.5 Carr's Index: Calculated to assess flow properties. [8]

2.6. Physicochemical evaluation

Determination of pH and moisture content for each compound used in the face pack formulation

2.7. Skin Irritancy test

A specific quantity of prepared face pack was applied to a marked area on the dorsal surface of the right hand for a specified duration. Erythema, edema, or irritation was assessed

2.8. Stability studies

The formulated product underwent a month-long stability test under different temperature conditions. Physical characteristics such as color, odor, pH, and texture were evaluated during storage in sealed glass vials at room temperature and 40°C [9]

3. Results and discussion

3.1. Organoleptic evaluation

Organoleptic characteristics, including color, texture, smoothness, and odor, were evaluated for the herbal face pack formulations as outlined in Table 3. The color of the formulations across batches S.B.1 to S.B.9 predominantly appeared as brown, with slight variations noted in batches S.B.4 and S.B.7, displaying a slightly lighter brownish hue. The pleasant and well-accepted smell observed in the prepared formulations is crucial for cosmetic products, indicating their suitability for consumer use. Moreover, the texture or smoothness of the formulations met the standards expected for cosmetic formulas, ensuring an agreeable sensory experience upon application.

This organoleptic assessment provides valuable insights into the sensory attributes of the herbal face pack formulations, affirming their compliance with cosmetic standards and their potential appeal to consumers. Additionally, the consistent color and desirable aroma contribute to the overall acceptability and marketability of the product, enhancing its potential for widespread use and positive consumer feedback [10].

Table 3. Results of organoleptic evaluation

Parameters	S.B.1	S.B.2	S.B.3	S.B.4	S.B.5	S.B.6	S.B.7	S.B.8	S.B.9
Color	Brown	Brown	Brown	Slight Brownish	Brown	Brown	Slight Brownish	Brown	Brown
Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
Texture	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent
Smoothness	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft

3.2. Physical evaluation

The table 4 provides detailed insights into the flow properties of the herbal face pack formulations across various parameters, including bulk density, tapped density, angle of repose, Hausner's ratio, and Carr's index. Notably, the formulations demonstrated desirable flow properties, characterized by consistent bulk and tapped densities, moderate angles of repose, and favorable Hausner's ratios and Carr's indices. These findings indicate optimal flow behavior, ensuring ease of handling and application of the face pack [11, 12]

Table 4. Results of physical evaluation

S No	Parameters	S.B.1	S.B.2	S.B.3	S.B.4	S.B.5	S.B.6	S.B.7	S.B.8	S.B.9
1	**Bulk density(g/ml)**	0.52	0.45	0.55	0.45	0.55	0.50	0.45	0.52	0.52
2	**Tapped density(g/ml)**	0.66	0.71	0.62	0.66	0.58	0.71	0.66	0.71	0.66
3	**Angle of repose**	28.2	21.2	36.3	32.6	25.2	22.2	24.3	21.8	27.4
4	**Hausner's ratio**	1.26	1.57	1.12	1.46	1.05	1.42	1.46	1.36	1.26
5	**Carr's Index (%)**	21.2	36.6	11.2	31.8	5.1	29.5	31.8	26.7	21.2

3.3. Physicochemical evaluation

Table 5 showcases the physicochemical properties assessed for the herbal face pack formulations. The evaluations revealed that the formulations maintained an almost neutral pH level, contributing to their compatibility with skin. Additionally, the moisture content fell within the specified range, indicating appropriate formulation consistency and stability [13, 14]

Table 5. Results of physicochemical evaluation

S No	Parameters	S.B.1	S.B.2	S.B.3	S.B.4	S.B.5	S.B.6	S.B.7	S.B.8	S.B.9
1	**pH**	7.1	7.8	6.8	7.2	6.7	6.5	7.0	6.9	7.4
2	**Loss on drying**	2.0	2.5	2.1	3.1	2.0	3.0	2.5	3.0	2.1

3.4. Skin irritation test

Conducting irritancy tests revealed that the formulated herbal face packs exhibited no signs of erythema, edema, or irritation, affirming their safety for skin use. This finding underscores the gentle and non-irritating nature of the formulations, enhancing their suitability for a wide range of users [15, 16] The results are shown in Table 6

Table 5. Results of skin irritation test

S No	Parameters	S.B.1	S.B.2	S.B.3	S.B.4	S.B.5	S.B.6	S.B.7	S.B.8	S.B.9
1	Irritancy	No	No	No	No	No	No	No	No	No
2	Erythema	No	No	No	No	No	No	No	No	No
3	Edema	No	No	No	No	No	No	No	No	No

3.5. Stability test

Table 7 presents the stability test results, demonstrating the formulations' robustness under different storage conditions. Notably, no significant changes were observed in terms of color, odor, texture, or smoothness at room temperature or at 40°C. However, minor alterations in pH were noted in specific formulations at elevated temperatures, indicating the need for careful storage considerations. Overall, the stability tests confirm the durability and reliability of the herbal face pack formulations, supporting their long-term efficacy and shelf-life [17]

Table 7. Results of Stability tests

Parameters	At Room Temperature								
	S.B.1	**S.B.2**	**S.B.3**	**S.B.4**	**S.B.5**	**S.B.6**	**S.B.7**	**S.B.8**	**S.B.9**
Color	Brown	Brown	Brown	slight Brownish	Brown	Brown	Slight Brownish	Brown	Brown
Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
pH	7.1	7.8	6.8	7.2	6.7	6.5	7.0	6.9	7.4
Texture	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent
Smoothness	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft
	At Room Temperature								
	S.B.1	**S.B.2**	**S.B.3**	**S.B.4**	**S.B.5**	**S.B.6**	**S.B.7**	**S.B.8**	**S.B.9**
Color	Brown	Brown	Brown	slight Brownish	Brown	Brown	Slight Brownish	Brown	Brown
Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
pH	7.1	7.8	6.8	7.4	6.7	6.5	7.1	6.9	7.4
Texture	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent
Smoothness	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft

4. Conclusion

In the current context, there is a growing demand for skin solutions that are free from side effects. The incorporation of herbal ingredients in cosmetic products has made them safer for use. Herbal face packs have emerged as a durable and efficient method for enhancing skin appearance. Therefore, the present study provides a valuable approach for creating a face pack using readily available natural ingredients such as rice flour, hibiscus powder, tulsi, turmeric, sandalwood, ashwagandha, and rose petals. The developed formulation has been deemed physico-chemically stable and exhibits qualities typical of skincare cosmetic products. Herbal face packs contribute to maintaining skin flexibility, enhancing blood circulation, revitalizing muscles, and purifying pores. The use of herbal cosmetics offers numerous advantages, including their non-toxic nature, ability to minimize allergic reactions, and inclusion of a wide array of substances with proven long-term benefits. Moreover, this face pack is cost-effective, practical, and meets all evaluation criteria effectively

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