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Herbal skincare paste: Formulation and demonstration its therapeutic potential for dermatological applications

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ABSTRACT

The increasing prevalence of tanning as a skincare concern, due to factors such as pollution, stress, UV radiation, and lifestyle, has prompted the need for the development of organic anti-tan formulations. The current study aims to synthesize an organic anti-tan substance and evaluate its various properties for both stability and effectiveness. It is well-known that the skin's natural defense mechanism against UV damage is the development of melanin, a dark brown pigment, to protect the skin from burning. Historically, plants have been utilized to meet the basic requirements for healthy and beautiful skin.

However, conventional cosmetics often contain toxic ingredients that can lead to regenerative issues and increased growth hazards, with studies suggesting that the more products utilized, the higher the potential for harmful concentrations in the body. Therefore, it is recommended to avoid cosmetics altogether. However, if use is deemed necessary, the use of natural or organic cosmetics is suggested. This project aims to create and assess a polyherbal face and body pack for cosmetic use, utilizing only natural ingredients.

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1. Introduction

The skin's healing itself mechanism against UV damage is a tan. In order to protect the skin from burning, UV light that penetrates the skin stimulates the formation of melanin, a dark brown pigment. Consequently, the skin becomes darker and develops a tan. UVA rays reach the lower layers of the epidermis, where they cause the production of melanin by melanocytes, a kind of cell. The brown pigment responsible for tanning is called melanin. The procedure that darkens or tans skin is called sun tanning. The first reaction of sunlight on skin is erythema, or redness, which is followed by tan development. Melanin and vitamin D are produced by the body in response to moderate sun exposure. Skin cells are shielded from UV B radiation damage by melanin. Following UV-induced DNA damage, p53 triggers transcription of the host gene, which includes

pro-opiomelanocortin (POMC). This increased release of melanocyte-stimulating hormone instructs melanocytes to increase melanogenesis and transfer melanosomes to keratinocytes via the melanocortin 1 receptor (MC1R). Together, these processes result in the tanning response.

Tans typically last seven to ten days, after which the skin begins to renew and exfoliate on its own. Exfoliation aids in removing dead, pigmented skin cells from the skin's outer layer. Products that brighten the skin aid in removing tan. Over the past century, there has been a significant increase in the prevalence of skin malignancies, which is mostly related to increasing sun exposure that emits UV rays. Many people continue to tan despite public education campaigns aimed at avoiding skin cancer, claiming factors such as the connection between tanning and mental and physical health, an active lifestyle, and physical attractiveness.

Due to their accessibility, low cost, and lack of toxicity, herbs are frequently utilised as remedies. Herbs have been

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used for cleaning, cosmetics, and other uses since ancient times.

There are several solutions on the market that promise to be the most gentle and natural way to remove tan. As a matter of fact, these items include an abundance of various compounds. Skin that has been overexposed to the sun or is already browned may become allergic to certain chemicals or substances. Using natural remedies to get rid of tan is one of the greatest options. These all-natural ingredients work wonders for clearing skin tan lines. Additionally, they won't have any negative effects and will improve skin health by supplying antioxidants and minerals. It keeps the skin moisturised and smooth while assisting in the removal of dead skin cells to lighten the tan. Herbal products preserve skin cells and give it a young shine. The current study focuses on determining the quality criteria and formulation of a herbal skin treatment for tan regions.^{1,2}

2. Materials and Methods

2.1. Material

2.1.1. Lemon (*Citrus limon*)

Lemons are classified as "citrus fruits" due to their therapeutic potential as members of the Rutaceae family. One of the most popular fruits eaten all around the world is the lemon. Lemon has been found as a potential source of anti-inflammatory, anticancer, and anti-diabetic characteristics based on the literature study.^{3,4}

It has been shown that people with acne can benefit from lemons since they contain both citric acid and vitamin C. Lemons, being an alkaline fruit, help get rid of a lot of different bacteria that cause acne.

Lemons appear to provide mental health benefits in addition to skin health benefits. It has been shown that eating lemons or breathing their aroma (aromatherapy) can improve and even lower mood as well as reduce stress, worry, nervousness, fatigue, and edoema. Figure 1

Lemons have been shown to have antiviral and antibacterial properties by science.^{5,6}

Lemon juice, also known as citrus limon, is a rich source of bioactive compounds such as carotenoids, tannin, terpenoids, and limonoid. Antibacterial properties are present in all of the bioactive components of lemons (*Citrus limon*). *Citrus aurantifolia*, or lemon juice, has antimicrobial qualities as well as extra applications as an antioxidant. Lemon juice, also known as citrus limon juice, is mostly made of vitamin C and citric acid.^{7,8}

It seems that lemons are beneficial for the mind in addition to their skin. Either consuming lemons or inhaling their fragrance (aromatherapy) has been demonstrated to enhance and even decrease mood as well as stress, anxiety, nervousness, weariness, and edoema.⁹

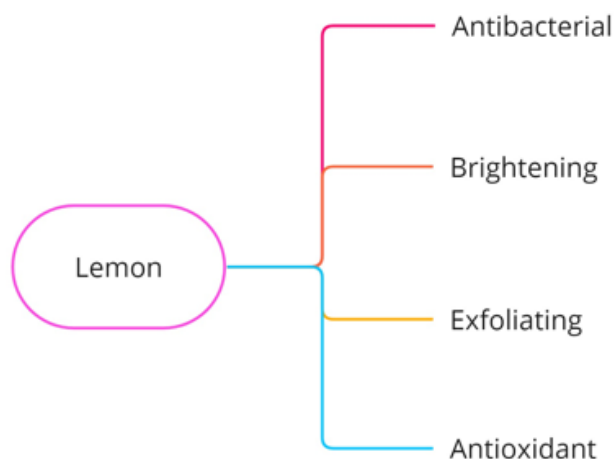


Figure 1: Potential effect of lemon

2.1.2. Chickpea

Chickpeas are an essential part of the human diet because of their high nutritional content and bioactive composition. They are getting enough lipids, carbohydrates, protein, and fibre. In addition, chickpeas contain a range of important vitamins, minerals, and bioactive compounds.^{10,11}

An annual herbaceous plant, chickpeas are grown extensively for their edible seeds as well as for herbal or medicinal reasons across tropical, subtropical, and temperate climates worldwide. Figure 2

Many medical and therapeutic uses for chickpea seeds have been documented, including the removal of tanning and the treatment of skin, liver, and bronchial conditions.

Chickpea seeds have often been reported to have a wide array of medicinal and therapeutic benefits, including the treatment of bronchitis, liver, skin diseases and removes tanning.¹²

2.1.3. Pearl millet

"Bajra," another name for pearl millet, is a great source of many nutrients that help achieve attractive skin.

Pear millet's phytochemicals are widely known for their anti-oxidant qualities.

Antioxidant-rich compounds help reduce the effects of free radicals and oxidative stress and are helpful as a defence mechanism against environmental stress. Pearl millet is a grain type that has long been used to lighten skin and get rid of tans. It has been demonstrated to have the ability to inhibit the synthesis of melanin and act as a natural exfoliant, eliminating dead skin cells and encouraging the formation of new ones to enhance the look of tanned skin. By eliminating tans and encouraging a brighter, more even skin tone, pearl millet can be a safe, natural approach to improve the look of the skin.¹³

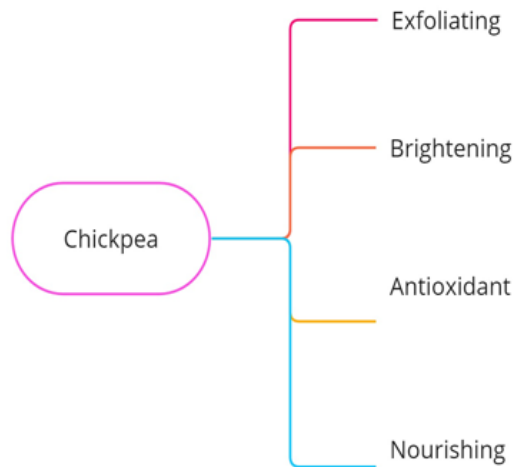


Figure 2: Chickpea effects



Figure 4: Versatility of milk effect

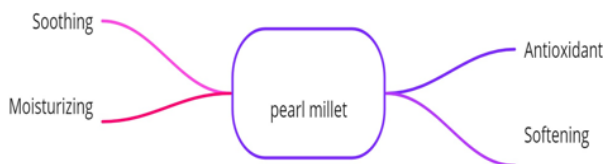


Figure 3: Pearl millet effects

of inflammatory markers. Saffron is well known for its antioxidant properties, but it also offers a number of other potential benefits in cosmetics, such as anti-aging, anti-pigmentation, anti-sun, and tanning reduction.^{16,17}

While saffron has been utilised for a wide range of medical applications and has been used by humans for a very long time as a natural colourant in cosmetics, little is known about how it works mechanistically to support healthy skin.¹⁸



Figure 5: Different potential of Saffron

2.1.4. Milk

Milk has several uses in dermatology and cosmetics due to its natural nature and lack of toxicity. Their biological potential is likewise quite great. Figure 4

Milk's rich cosmetics, especially in terms of proteins such immunoglobulins, β -lactalbumin, lactoferrin, lactoperoxidase, lysozyme, and lactoferrin, are probably responsible for its wide variety of biological features. As active ingredients, they are also gaining more recognition for their capacity to ameliorate inflammatory changes in the skin, reduce the quantity of blackheads and acne lesions, regulate sebum production, and offer a host of other benefits including moisturising, protecting, tanning, smoothing, CC, whitening, calming, and antiaging.^{14,15}

2.1.5. Saffron

The common name for saffron is "kesar". The saffron plant belongs to the family Iridaceae. Saffron is widely recognised for its anti-sun qualities, which help protect skin from UV rays that can cause damage. Studies suggest that saffron lotion may work better as a sunscreen than homosalate. Saffron is widely recognised for lowering melanin levels. Figure 5

It is hence effective as a skin-lightening agent. Saffron, which is high in antioxidants, may inhibit the formation

2.1.6. Turmeric (*Curcuma longa*)

For ages, the Indian subcontinent's inhabitants have utilised turmeric, a golden spice, with no known negative consequences.¹⁹

Turmeric contains antibacterial and anti-inflammatory properties. It soothes skin issues and lessens redness from blemishes. It is a natural antibacterial and works wonders for tan blemishes. The main source of turmeric's health benefits is curcumin, a bioactive substance having anti-inflammatory and antioxidant properties. Diaryl heptanoid curcumin (IUPAC name: (1E,6E)-1,7-Bis(4-hydroxy-3-methoxyphenyl) hepta-1,6-diene-3,5-dione) is a tautomer chemical that may be found in water as a keto form or in organic solvents as an enolic form. This polyphenol has been found to have pleiotropic effects due to its capacity to affect several signalling molecules. Since its

discovery in 1949, curcumin has been demonstrated to possess anti-bacterial, anti-inflammatory, pro-apoptotic, chemopreventive, chemotherapeutic, anti-proliferative, and wound-healing properties. Figure 6

It has been demonstrated that the widely used spice turmeric (*Curcuma longa*) possesses anti-inflammatory, antibacterial, antioxidant, and anti-neoplastic qualities.^{20,21}

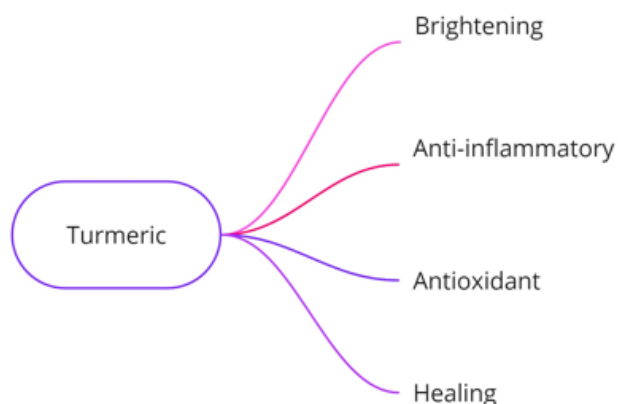


Figure 6: Various effect shown by turmeric.

2.1.7. Potassium sorbate

Since potassium sorbate is a useful preservative in the food, pharmaceutical, and cosmetics sectors, concerns about its safety for humans must be raised. Figure 7 This ingredient keeps the items fresher longer by inhibiting the formation of mould and preventing spoiling.^{22,23}

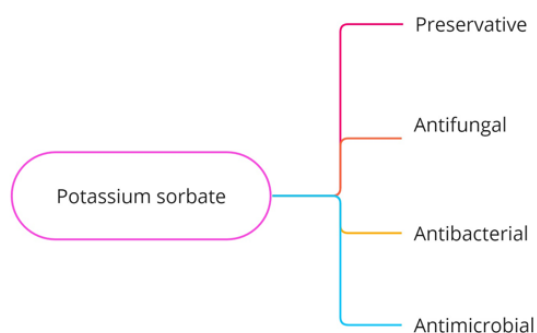


Figure 7: Effectiveness of potassium sorbate

2.2. Method

1. Soak a few saffron threads in milk for approximately 15 minutes.
2. In a separate bowl, combine 1 tablespoon of chickpea flour, 1/4 teaspoon of turmeric, 1 tablespoon of pearl millet flour, and 1 teaspoon of lemon juice to create a

paste-like consistency.

3. Add the saffron-infused milk to the mixture and blend all ingredients together.
4. Add potassium sorbate in formulations typically range from 0.1% to 0.5%.
5. Apply the paste to areas of the body where tanning is present, ensuring to avoid the areas around the eyes and lips. Allow the paste to dry for 15 to 20 minutes.
6. Gently exfoliate the skin using circular motions and then rinse with warm water.
7. Afterward, it is recommended to apply a moisturizer to the skin.

Shuffling or altering the quantities may have some impact on the effectiveness of the paste. Different proportions can affect the consistency, texture, and overall properties of the mixture. For example, changing the ratio of ingredients might result in a thicker or thinner consistency, different color, or altered flavor profile.



Figure 8: Formulated paste

2.3. Precaution

It is recommended that you use the face pack for no more than 20 to 25 minutes at a time to prevent any possible negative effects. Extended use might lead to wrinkles, drooping skin, and increased pores. Applying the face pack once a week is advised. Refrain from scratching or peeling off the dry face pack as this might harm the skin underneath. It is recommended to add an ice cube to the skin and spray water on the face before removing the dry face pack. This will help to tone, soothe, and tighten pores.

Additionally, it is advised to avoid excessive face washing and exposure to heat after applying the face pack to prevent the appearance of dark patches and pimples.

3. Results

After applying this herbal organic cream, individuals can expect to see a decrease in dry or sun-kissed skin in three to four days, or up to seven days. All-natural elements in this lotion help to improve and brighten skin. The demand for organic products is rising in society as people place more and more emphasis on their health and wellbeing. Consequently, using this cream may result in an improvement in the texture and brightness of the skin.

4. Conclusion

It has been demonstrated that the use of natural astringents, like lemon, can help to balance skin tone and lighten dark spots. It is often known that saffron's anti-inflammatory and antioxidant qualities can minimise the visibility of wrinkles and fine lines. Naturally occurring in milk, lactic acid has been shown to help gently exfoliate skin and enhance its texture. The skin may be strengthened and nourished with chickpea flour, a natural source of protein. The combination of these components in a face pack cream may improve the skin's general health and look. This all-natural face pack cream is made to successfully erase tanning in three to four days or a week without the use of chemicals and without affecting the skin's look. Made entirely of natural components, this face pack cream is intended to efficiently erase tanning in three to four days or a week without the use of chemicals.

5. Abbreviations

UV: Ultraviolet

6. Source of Funding

None.

7. Conflict of Interest

None.

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