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Formulation and Evaluation Of Multipurpose Herbal Cream From Betel Leaf And Tulsi.

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ABSTRACT:

The formulation and evaluation of a herbal cream containing extracts from Betel leaf (Piper betle) and Tulsi (Ocimum sanctum) were carried out to explore their potential therapeutic properties in skin care. The preparations used to improve a person's looks are called herbal cosmetics. The current study's goal was to create a herbal cream that will moisturize, nourish, lighten, protect, and treat a range of skin conditions. Betel leaf and Tulsi are known for their antimicrobial, anti-inflammatory, and antioxidant properties, which are beneficial for treating skin disorders. Products used to enhance one's appearance are known as herbal cosmetics. Creating a herbal cream that would moisturize, nourish, whiten, and treat a variety of skin conditions was the aim of the study. Among the fundamental ingredients used to produce the cream are Betel Leaf(Piper betel) and Ocimum sanctum (tulsi leaves). The physicochemical properties, such as pH, Spreadability, and viscosity, were evaluated to ensure user acceptability. The herbal cream showed significant anti-inflammatory and wound healing effects, making it an effective natural alternative for skin care.

KEYWORDS: Herbal Cream, Betel leaf, Tulsi, Piper betel, Ocimum sanctum, Topical Formulation, Anti-Inflammatory.

Introduction:

Herbal creams have gained significant attention in recent years due to their natural healing properties and minimal side effects compared to synthetic products. Betel leaf (*Piper betle*) and Tulsi (*Ocimum sanctum*), both renowned in traditional medicine, offer a wealth of therapeutic benefits. Betel leaf is widely acknowledged for its antimicrobial, antioxidant, and anti- inflammatory properties, while Tulsi, often called the "Queen of Herbs," is known for its adaptogenic, antibacterial, and anti-inflammatory qualities. These two plants, when combined, form a potent herbal formulation that can address various skin concerns, such as acne, inflammation, and infections. To create a herbal cream that is safe, effective, and simple to use, the therapeutic chemicals from betel leaf and tulsi must be extracted and combined with a cream base. To make sure the herbal cream is safe, effective, and of high quality, evaluation is essential. Testing for characteristics including stability, spreadability, pH, physical appearance, and microbiological contamination are all part of this assessment. The dermatological qualities of the cream, such as its capacity to heal and calm the skin without causing allergic responses or irritation, are evaluated as well. [1]

The purpose of this study is to create a herbal cream with extracts from betel leaf and tulsi and then thoroughly evaluate its effectiveness, safety, and quality for possible application in skin care. It is expected that the resulting cream, which combines the therapeutic qualities of these two plants, will offer sustainable, natural skin care treatments without the possible negative effects of synthetic products. A mixture called herbal cream is applied to improve one's attractiveness. A "herbal cosmetic" is a product that contains only herbal ingredients and is meant to have specific cosmetic benefits. Because herbal treatments don't have any harmful side effects, their demand has increased rapidly. The demand for herbal cosmetics continues to increase these days. Because of their outstanding properties and absence of side effects, herbal formulations are gaining popularity. Massage therapy, foundation, and vanishing creams are also included. [2]

Natural cosmetic formulations known as herbal creams have grown in popularity because of their therapeutic advantages and gentle approach to skin care. Plant-based components with healing, calming, and improving qualities are used to make herbal creams, as opposed to synthetic ones that could contain harsh chemicals and preservatives. These creams utilize the effectiveness of botanicals and herbs to treat a range of skin issues, such as irritation, wrinkles, dryness, acne, and inflammation, without affecting the skin's inherent health. [3]

Objectives:

1. Formulate a herbal cream using extracts from Betel leaf (*Piper betle*) and Tulsi (*Ocimum sanctum*) that is safe, effective, and suitable for topical application.

2. To evaluate the physical properties of the herbal cream, including its texture, color, consistency, and spreadability, ensuring it is user-friendly and suitable for skin application.

3. To assess the pH of the herbal cream and ensure it falls within a safe and appropriate range for skin care, minimizing the risk of irritation.[17]

4. To determine the moisturizing and anti-inflammatory effects of the herbal cream, evaluate its ability to soothe and hydrate the skin, reducing conditions such as redness, swelling, and inflammation.

5. To compare the efficacy of the herbal cream with other commercially available products, determining whether Betel leaf and Tulsi extracts offer superior benefits in skin care.

6. Analyze the cost-effectiveness and sustainability of the formulation, ensuring that the cream is not only effective but also economically viable for production and use on a larger scale. [4-5]

DRUG PROFILE:

Betel Leaf:

Family: Piperaceae
Biological Source: The biological source of the betel leaf is *Piper betle*, a vine from the *Piperaceae* family.
Biological Name: Piper betle
Chemical Constituents: Caryophyllene, Eugenol, Methyl eugenol, Safrole

Benefits of Betel Leaf for Skin:

1. **Antioxidant properties**: It help protect the skin from damage caused by free radicals.
2. **Anti-inflammatory:** Reduces inflammation and soothes irritated skin.
3. **Antibacterial and antifungal:** Helps prevent acne, infections, and skin rashes.
4. **Promotes wound healing:** Aids in the healing of cuts, burns, and other skin injuries.
5. **Hydrating:** Moisturizes the skin and helps maintain its elasticity. [6]

Medicinal Uses of Tulsi:

1. It is used to treat infections due to its antibacterial, antifungal, and antiviral properties.
2. It promotes digestion and can help relieve indigestion and bloating.
3. Helps reduce inflammation and can be applied to swollen areas.
4. It acts as a natural detoxifier by helping eliminate toxins from the body.[16]

Tulsi:

Family: Lamiaceae
Biological Source: Leaves of Ocimum species, such as Ocimum sanctum L. and Ocimum basilicum L., either fresh and dried.
Biological Name: Ocimum tenuiflorum
Chemical Constituents: Eugenol, Carvacrol, Linalool, and Rosmarinic acid

Benefits of Tulsi Leaf Powder:

a) Boosts Immunity: Tulsi powder strengthens the immune system due to its antioxidant, antibacterial, and antiviral properties.
b) Reduces Stress: It has adaptogenic properties, helping the body cope with stress and reduce anxiety.
c) Improves Digestion: Helps in improving digestion and relieving indigestion, bloating, and constipation.
d) Anti-inflammatory: Reduces inflammation, helping conditions like arthritis and skin irritation.
e) Detoxifies the Body: It helps flush out toxins, improving overall health and skin appearance.
f) Skin Health: Its antibacterial properties help treat acne and skin infections and promote clear skin. [7]

Aloe Vera:

Family: Asphodelaceae
Biological Source: Dried latex of leaves
Biological Name: Aloe barbadensis Miller
Chemical Constituents: Flavonoids, Vitamins, Minerals, and Polysaccharides.

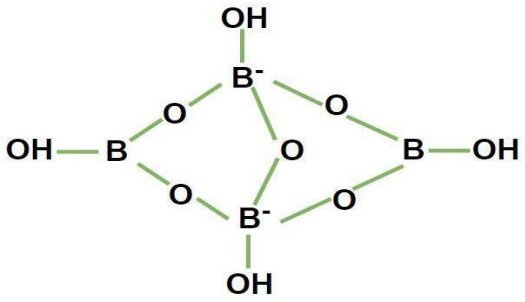
Benefits of Aloe Vera for Skin:

a) **Moisturizes**: It hydrates and nourishes the skin without making it greasy, making it ideal for dry skin.
b) **Soothes Irritation**: Aloe vera has cooling properties that help reduce redness, itching, and inflammation caused by sunburn or skin conditions.
c) **Promotes Healing**: It accelerates the healing of cuts, wounds, and minor burns.
d) **Fights Acne**: Its antibacterial and anti-inflammatory properties help reduce acne breakouts and soothe irritated skin.
e) **Reduces Signs of Aging**: Aloe vera stimulates collagen production, improving skin elasticity and reducing wrinkles and fine lines.
f) **Evens Skin Tone**: Helps lighten dark spots and pigmentation, providing a more even skin tone.
g) **Acts as a Sunburn Remedy**: It helps in relieving the pain and redness caused by sunburns and accelerates the recovery process. [8]

Beeswax:

Beeswax is a natural wax produced by honeybees (*Apis mellifera*) and is used by them to build honeycombs. It has a variety of uses and benefits. Beeswax is produced by worker bees in specialized glands located on their abdomen. They secrete the wax in the form of small flakes, which they mold into hexagonal cells to store honey and pollen. After bees form the honeycomb, the wax is harvested and purified for use by humans. [9]

Borax:



Molar mass: 381.37g/mol
Formula: $Na_2 [B_4O_5 (OH)_4] \cdot 8H_2O$
IUPAC name- Sodium tetraborate decahydrate
Melting point: 743°C
Appearance: White or colourless crystalline solid.

Uses:

a) Use as a moisturizer.
b) Use as a buffering agent.
c) It is used to prevent bacterial growth

Rose Oil:

Family: Rosaceae
Biological Source: The petals of different Rosa species, especially Rosa centifolia L. and Rosa damascena Mill.
Biological Name: Rosa centifolia L
Chemical Constituents: Monoterpenes, Terpenes, Flavonoids, and Rose Oxide.

Uses:

1. It helps hydrate dry skin and maintain a healthy moisture balance.
2. Rose oil is gentle on the skin and helps calm irritated skin, reducing redness and inflammation.

Formulation Table:

Sr No.	Ingredients	Quantity (30 gm)	Uses
1	Betel leaf extract	3 ml	Antibacterial, Helps to fight infection
2	Tulsi extract	3 ml	Antioxidant protects cells from damage
3	Aloe-vera gel	6 ml	Anti-aging reduces acne and pimples
4	Beeswax	4 gm	Thickening agent
5	Borax	2 gm	Alkaline agent
6	Methylparaben	1 gm	Preservative
7	Liquid paraffin	5 ml	Emollient

8	Rose Oil	1 ml	Fragrance
9	Distilled Water	q.s	Vehicle

Material And Method:

Extraction Process:

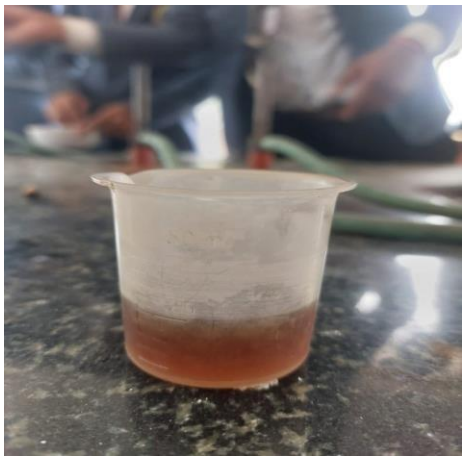
The technique used to separate active ingredients from plants, herbs, or other natural sources is known as the extraction process. To extract the desired components, plant materials are usually broken down.

Extraction of Betel leaf:

Fresh Betel leaves are collected from the plant. The leaves are washed thoroughly to remove dirt and impurities. The leaves are chopped into small pieces to increase surface area for extraction. A solvent (like ethanol, water, or glycerin) is added to the chopped leaves. The mixture is heated for a period to allow active compounds to dissolve into the solvent. The plant material is filtered out. [10]

Extraction of Tulsi Extract:

Tulsi leaves were collected, washed with distilled water, and then dried in a hot air oven. The leaves were ground into a powder once they had adequately dried. Then, 10 grams of powdered Tulsi leaf and 100 milliliters of ethanol were put into a volumetric flask. Following that, the mixture was boiled in a water bath at 80°C to 100°C for five to ten minutes. Tulsi leaf extract and filter paper were then added to the mixture. [11]



Formulation Of The Cream:

1. **Preparation of Plant Extracts:**

Extract betel leaf and tulsi by boiling the leaves in water and then straining the solution. Alternatively, you can use concentrated herbal extracts available in the market.

2. **Oil Phase:**

In a double boiler, melt together the coconut oil, Beeswax. Stir gently until everything is completely melted and well combined.

3. Water Phase:

In a separate beaker, combine the aloe vera gel and the betel leaf and tulsi extracts. Heat gently to around 70°C (160°F), but don't let it boil.

4. Combined Phases:

Slowly add the water phase to the oil phase while mixing constantly. Use a hand blender or a whisk to emulsify the mixture until it thickens and becomes smooth.

5. Cool Down Phase:

Allow the mixture to cool to about 40°C (104°F). Add the preservative and essential oil at this point, then mix thoroughly.

6. pH Adjustment:

Check the pH of the cream, adjusting it with citric acid if necessary to bring it to a skin- friendly range (5.5-7).

7. Packaging:

Transfer the cream into sterilized jars or containers. Let it cool completely before sealing.[12]

Evaluation Parameter:

1. Physical Parameter:

In this test the color, odor, texture, and state of cream are observed.

2. Consistency:

The formulation was examined by rubbing cream on the hand manually. The cream has a smooth consistency.

3. Irritancy:

First, we took a measurement of one centimeter squared for a small area on the back of the left hand. After the application of cream, we took note of the time. After up to a day, we looked to see whether there was any swelling or redness. We told someone about it if it was true.[14]

4. pH Value:

pH of the prepared herbal cream was measured by using a digital pH meter. The solution of cream was prepared by using 100 ml of Distilled water and set aside for 2h.

5. Spreadability test:

This measures how simple it is to apply a substance to a surface. We conducted this test for variables, denoted as F1. A variable is said to have good spreadability if it spreads readily and rapidly. Our test results showed that F1 was the most spreadable.[15]

6. Washbility:

The formulation was applied on the skin, and then easy extends of washing with water was checked. [13]

Physical Parameter

Sr No.	Parameter	Testing Result
1	Color	Off-white or light cream color
2	Odor	Pleasant
3	Texture	Smooth
4	State	Semi-solid

Table 1: Physical parameter of cream

Irritancy:

Sr No.	Formulation	Irritant Effect	Erythema	Edema
1	Testing Result	Nil	Nil	Nil

Table 2: Irritancy test of cream

Washability Test:

Sr No.	Formulation	Washability
1	Testing Result	Washable

Table 3: Washability test for cream

Phase Separation Test:

Sr No.	Formulation	Phase Separation
1	Testing Result	No phase Separation

Table 4: Phase Separation of cream

Spreadability Test:

Sr No.	Formulation	Time (in sec)	Spreadability (gmc/sec)
1	Testing Result	6	4

Table 5: Spreadability

Stability Study:

Sr No.	F1
Color	Light cream color
Odor	Pleasent
Texture	Smooth
State	Semi-Soild
Irritant effect	Nil
Edema	Nil
Washability	No Washable
Spredability Time (sec)	6

Table 6: Stability study of herbal cream

Result:

To make a special cream, the scientists used a variety of plants. such as Tulsi, aloe vera, and betel leaf. We analyzed the cream's thickness, feel, and irritant potential to determine its quality. We also look at the cream's potential for irritation, thickness, and ease of washing. We look at the physical characteristics of the cream.

Sr No.	Evaluation test	Observation
1	Color	Off-white or light cream color
2	Odor	A Sweet and Pleasant Fragrance
3	Consistency	The cream having smooth consistency
4	pH	Between 5.5 to 7
5	Spreadability	Good Spreadability
6	Washability	Oil-Based Cream- Poor washability by water

Discussion:

We created a unique cream by combining various herbs. (Tulsi, Betel leaf, and aloe vera). It didn't feel oily and was simple to remove. It has a decent consistency and spreads easily. It doesn't annoy or divide.

Conclusion:

The herbal cream formulated with betel leaf and tulsi proves to be an effective and stable product that combines the best of nature's ingredients for healthy, rejuvenated skin. Its moisturizing, soothing, and healing properties, along with the natural antimicrobial action of its active ingredients, make it an excellent choice for consumers seeking a natural alternative to conventional skincare products. The cream was made using a special method, and its quality was checked by testing it. Considerations were made for the cream's texture, acidity, spreadability, skin-friendliness, ease of washing off, thickness, and cohesion.

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