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Dinesh Kumar
Research Scholar, School of Pharmacy & Research, DBUU, Manduwala, Dehradun, Uttarakhand, India

Ambrish Dubey
Research Scholar, School of Pharmacy & Research, DBUU, Manduwala, Dehradun, Uttarakhand, India

Payal Saxena
Assistant Professor, School of Pharmacy & Research, DBUU, Manduwala, Dehradun, Uttarakhand, India

Corresponding Author:
Payal Saxena
Assistant Professor, School of Pharmacy & Research, DBUU, Manduwala, Dehradun, Uttarakhand, India

Preparation and evaluation of cream containing *Tridax procumbens* extract for wound healing activity

Dinesh Kumar, Ambrish Dubey and Payal Saxena

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Abstract
This work focuses on the creation and assessment of a herbal cream utilization *Tridax procumbens* L. leaves, a recognized medicinal plant with diverse pharmacological attributes. The leaves were gathered from several sites nearby. Following through washing and shade drying, the fine powder has been prepared and stored for extraction. Using a soxhlet system, the powdered leaves were extracted methanolic. 500 milliliters of methanol were used to extract 100 grams of extract over the course of 24 hours at 64 °C. The existence of important phytoconstituents such as alkaloids, phenols, tannins, terpenoids, saponins, and steroids, was verified by preliminary both F1 and F2 exhibited the inherent qualities of the plant extract, as seen by their light green color, silky texture, and pleasant herbal odor. Both formulation were readily removed with water without leaving any residue on the skin according to wash-ability test. The cream were found to be compatible with the pH of the skin. With F1 having a pH of 6.8 and F2 having a pH OF 6.7 tests of readability showed that F1 applied more uniformly and smoothly and had a higher spreading ability (1 cm) then F2 (1.35) additionally, F1 had a thinner, better consistency for topical application and left less residue. In summary, the herbal cream made using extract from *Tridax procumbens* shows promise for use in skincare products. The stability, uniformity and overall performance.

Keywords: Formulation, evaluation, *Tridax procumbens*, herbal cream

Introduction
In the global health care system, ayurvedic medicines—which comprise herbs, herbal material, herbal preparation, and final herbal product—are becoming an increasing part. A single plant can have hundreds of thousands of chemical components, according to studies in phytochemical and pharmacology. These components interact to produce a pharmacological action through a network of distinct targets and pathways. Free radical molecules that can damage cells include reactive oxygen free radicals, 1 and agents known as proxies. Herbal therapy is predominant in both traditional and alternative medicine across developing and wealthy nations. The widespread interest in drug derived from plant because of the belief that plant are safe and dependable, and with lesser side effects. Review of literature reveals that traditional plant drug are beneficial for several skin related problems and for wound several healing [1] world health organization (WHO) as well as our country has been promoting. Utilization of traditional medicine due to its cost-effectiveness, accessibility, and holistic nature. Certain. European and oriental centuries have been in practice since the centuries [2, 3]. Great work has been done which eluded the common man reach and knowledge with the techno-serve lifestyle in 21st century effective remedies and the golden fact is use of herbal treatment is independent of any age group [4]. Numerous studies have been conducted with other the extract of *Tridax procumbens* L. Along with other dosage forms herbal drug are also available in the form of ointment which is semisolid preparation used topically for several purposes English in coat buttons and daisy, because of the appearance of its flowers and is an Ethno botanically important medical plant. The plant has been considered as a gregarious weed, distributed throughout the tropic and sub tropic. Traditionally in India, *Tridax procumbens* leaves have been used as one of the most popular remedy for dermal wound. Earlier workers have reported that it possesses anti-diabetic, antibacterial, antioxidant, antimicrobial, immunomodulatory, wound healing and anti cancerous properties [5, 6].

Therapeutic benefits
The many therapeutic advantages herbal creams offer the skin are what make them so appealing. It has antioxidant properties that aid in the fight against free radicals, the reduction of inflammation, and the encouragement of skin regeneration. Numerous botanical extracts include antibacterial, anti-inflammatory, and calming qualities, which means that herbal creams can be used to treat a variety of skincare issues, from acne and aging symptoms to dryness and irritation.

Formulation
Herbal lotions' mild and secure formulas are among their main benefits. Herbal creams give natural, plant-based components precedence over harsh additives and synthetic chemicals that are frequently present in traditional skincare products. For people with sensitive skin or those looking for substitutes for potentially irritating or allergic components prevalent in popular cosmetics, this makes them perfect.

Composition of herbal creams
Typically, creams' ingredients include

Water phase
Functions as a solvent for hydrophilic (water-soluble) components and supplies hydration.

Oil phase
Provides emollient qualities and acts as a vehicle for substances that are lipophilic, or soluble in oil.

Emulsifiers
Maintain the water-oil interface's stability and avoid phase separation.

Active ingredients
Offer therapeutic benefits like anti-aging, hydrating, or antioxidant qualities.

Excipient
Improve the stability, texture, viscosity, and sensory characteristics of the cream formulation.

Ideal properties of face cream
1. Increased Spread ability and Application Simplicity.
2. Improved Appearance.
3. Texture Melting or Liquefaction.
4. Action of Pore Refining and Flushing.
5. Avoiding Dryness.
6. Protective, lubricating, and softening qualities.

Advantage of herbal cream
Ease to application
Creams are generally smooth and easily spreadable, facilitating application to the skin without inducing irritation or leaving a greasy residue.

Targeted delivery
Creams provide targeted distribution of active chemicals to particular regions of the skin, rendering them beneficial for addressing localized disorders such as eczema, acne, and psoriasis.

Moisturizing properties
Glycerin is one of the hydrating ingredients included in many lotions, which helps hydrate the skin and enhance its texture and look.

Versatility
Numerous active substances can be used into cream compositions, enabling customization to satisfy particular skincare requirements or therapeutic objectives.

Stability
Creams that are properly made can last a long period without losing their effectiveness. In contrast to other formulations like gels or lotions, they are less likely to oxidize or degrade.

Disadvantage of herbal cream
Occlusive nature
Even though creams work well to hydrate the face, certain people, particularly those with oily or acne-prone skin, may experience pore congestion and flare-ups due to their occlusive qualities.

Potential sensitivity
Careful ingredient selection is required since certain people may experience adverse reactions or skin sensitivities from typical cream ingredients including scents, preservatives, and emulsifiers.

Material and Method
Collection of the Plant
Tridax procumbens L. leaves were gathered form several locations throughout Dehradun and the surrounding areas, and they were then properly cleaned with distilled water. After being washed, the plant pieces are left in full shade. drying, then being ground into a fine powder using a mechanical grinder and kept in an airtight container for storage. after plant vitrifaction [no.1667] From the (BSI) Dehradun.

Preparation of Plant Extract
Tridax procumbens L. was laundered and air-dried for two weeks. After drying the homogenate was transformed into a fine powder by using an electric mixer. A Soxhlet apparatus was used to extract 100 g of dried *Tridax procumbens* leaves, which were then stored in a refrigerator at 40c for later use. The extraction process involved 500 ml of methanol for 24 hours at 640c, and the extract was filtered through Whitman filter paper no. 41 (110 mm). The resulting solution was concentrated in vacuum to give the methanol extract its dryness.

Preliminary phytochemical screening
Using established test procedures, a preliminary phytochemical screening and quantitative test for the presence of

1. Test for Alkaloids
Anthraquinones, phenols, tannins, flavonoids, alkaloids, terpenoids, steroids, and saponins were conducted [7]. Standard techniques were used to identify these phytochemical based on their color change properties [8].

2. Test of Phenols

Phenols

When 0.5 ml of FeCl3 (w/v) solution was added to 2 ml of test solution, a strong hue formed, indicating the presence of phenols [9].

Test of Flavonoids

NAOH

A test tube was filled with two to three milliliters of extract and a few drops of sodium hydroxide solution. creation of the vivid yellow hue that didn't turn colorless when a few drops of diluted HCl were added, indicating that flavonoids 12 weren't present [10].

Iodine Test

A few drops of diluted iodine solution added to three milliliters of test solution produced a blue tint that vanished when it boiled and returned when it cooled [10].

Gelatin Test

The extract was supplemented with a solution of gelatin, which dissolves instantly in warm water. .The presence of tannins was shown by the production of a white precipitate.

Lead Acetate Test

Five milliliters of extract were mixed with a few of a 10% lead acetate solution. Tannins were present when a yellow or red precipitate formed [11].

Test of Saponins

Foam test

After diluting the extract with 20 milliliters of distilled water, it was agitated for fifteen minutes in a graduated cylinder. Saponins were detected by a 1 cm layer of foam [12].

Evaluation of Herbal Cream

Physical Parameters

The color, odor, texture, and overall condition of the cream were evaluated throughout this examination [14].

Irritancy test

The left dorsal surface was delineated with a specified area of 1 cm^2. The cream was carefully administered for even coverage, and the application duration was precisely documented for proper evaluation. Any indications of erythema, edema, or irritating effects were closely examined and reported after intervals of up to 12 hours. Mark the region on the dorsal surface of the left hand. This test aids in determining whether the cream formulation may cause skin sensitivity or irritation [15].

Wash ability test

The wash ability test involved lightly applying a tiny amount of the cream to the hand and then rinsing it with tap water. In terms of comfort and convenience, this implies that the creams have good rinse-off qualities [16].

Determination of PH test

A pH paper was used to measure the creams' pH. To make a solution, distilled water was combined with a tiny bit of cream. To ascertain each cream's pH level, pH paper was dipped into the solution and the color shift was noted and compared to a PH color chart .This test aids in determining the cream formulation's acidity or alkalinity, which is crucial for stability and skin compatibility [17, 18].

Spread ability test

A tiny amount of cream was sandwiched between two glass slides as part of the spread ability test. The spreading action on the skin was then replicated by carefully moving one glass slide horizontally over the other. Better spread ability of the cream was demonstrated by a shorter duration and smoother movement [19, 20].

Phase separation

The herbal cream's stability is evaluated using the phase separation test, which looks for any phase separation over the course of 24 hours throughout 30 days. After the cream was put in a transparent container, it was visually inspected for indications of separation, including visible layers forming or oil collecting on the surface. This test aids in determining whether the cream will be stable and keep its uniform consistency for the duration of its targeted shelf life. Phase separation was seen and evaluated, and the results were documented [21].

Results and Discussion

The cream's creamy quality was constant throughout, and its texture was constantly smooth. There were no discernible particles or phase separations. In keeping with the inherent color of the botanical ingredients employed, the cream had a light yellow tint. As a result of the botanical extracts included in the composition, the cream had a subtle herbal scent. The herbal cream had a uniformly Smooth consistency.

Irritancy test

Following the application of the herbal cream in all formulations, the irritancy test showed no signs of skin irritation, including edema (swelling) or erythema (redness). (table 2)

Wash ability test

The herbal cream formulations showed good removal in the wash ability test after being washed with water. After washing, there was no residue on the skin, suggesting that the product had high wash ability qualities. (table 3)

pH test

A pH paper was used to measure the creams' pH. To make a solution, distilled water was combined with a tiny bit of cream. To ascertain each cream's pH level, pH paper was dipped into the solution, and the color shift was noted and compared to a pH color chart. This test aids in determining the cream formulation's acidity or alkalinity, which is crucial for stability and skin compatibility.

Spreadability test

For each of the five formulations (F1, F2), spreadability tests were performed. Better spreadability. The cream spreading more readily) is indicated by higher spreadability numbers. (table 4)

Table 1: Composition of herbal cream (*Tridax procumbens* L. cream formulation)

S. No.	Ingredients	quantity(F1)	(F2)
1.	Herbal Extract	1.5gm	2 gm
2.	Cetyl alcohol	2 gm	2.5 gm
3.	Glyceryl monostrate	1 gm	1.3 gm
4.	Petroleum jelly	5 gm	5.5 gm
5.	Olve oil	5 gm	5.5 gm
6.	Sodium benzoate	1 gm	1.3 gm
7.	Beez wax	1 gm	1.3 gm
8.	Vitamin E	1 ml	1,4 gm
9.	Demineralized water	Q.s	Q.s
10.	Tween 80	1 gm	1 gm
11.	Rose oil	Q.s	Q.s

Table 2: Irritancy Test

S. No.	Formulation	Irritancy	Edema	Erythema
1	F1	No irritation	No irritation	No irritation
2	F2	No irritation	No irritation	No irritation

Table 3: Wash ability Test

S No.	Formulation	Wash ability
1	F1	Easy removation of the cream with water
2	F2	Easy removation of the cream with water

Table 4: Spreadability Test

S. No	Formulation	Consistency	EASY/SPRAD	Coverage	Residue	Spread Ability
1.	F1	thin	spread smoothly	Spread evenly	Small residue	1 cm^2s
2.	F2	thick	spread smoothly	Left patches	No residue	1.35 cm^2s

Conclusion

The skin's physical look appears to be improved by the herbal face lotion that was created. The Formulated Herbal face cream tastes well, is smooth, and is semi-solid, yet the F2formulation is stable and doesn't separate. Additionally, it possesses favorable rheological and physical characteristics, including pH, viscosity, spread ability, wash ability, after-feel, non-irritancy, and lack of greasiness. Furthermore, it is stable and doesn't experience phase separation, which makes it an excellent option for skincare. The findings of the formulation and testing of the herbal cream were encouraging, and formulation F1 was chosen because of its better stability and consistency. F1is a great option for skincare applications because of its improved texture and spread ability, which provide a uniform and smooth application experience. Overall, F1 is the most notable formulation based on the formulation and evaluation of the herbal cream.F1 is a great option for skincare treatments due to its improved texture and spread ability, which provide a uniform and smooth application experience. Overall, F2 is the most notable formulation based on the formulation and evaluation of the herbal cream.

Abbreviation

e.g.-(Example), g-(gram), °C-(degree celsius), mm-(mili meter), ml-(milliliter) cm-(centimeter), f1-(formulation)

Conflicts of Interest

The authors assert the absence of any conflict of interest, whether financial or otherwise. The writers disclose that they have no financial or other conflicts of interest.

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