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Exploring the Antifungal Properties of Tridax Procumbens" in a Herbal Lotion Formulation

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ABSTRACT

India's fields are home to a prevalent weed called Tridax procumbens. The study's goal was to create a safe and effective antifungal lotion that uses Tridax procumbens L. leaf extract. Many civilizations have long utilized Tridax procumbens to cure cuts, wounds, and skin infections. It has antioxidant, antibacterial, anti-inflammatory, and wound-healing qualities. This ongoing study aims to evaluate this wound healing activity and further formulate an herbal lotion from the extract of T. procumbens.

Keywords: Tridax procumbens, Wound Healing Properties, Herbal Lotion, Antifungal, topical formulation

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INTRODUCTION

Lotion:

A liquid usually aqueous medicinal preparation containing one or more soluble substances and applied externally for skin[1-8]. Body lotions are formulations meant to be used all over the body. They provide your skin with its daily dose of hydration and nourishment. The sun, environmental factors, sweat, hot showers, central heating and cold snaps can all leave the skin dry and irritated[8].

Advantages:

1. Lotions maintain skin's hydration levels by locking in the moisture.
2. Can be customized with additives.

Disadvantages:

1. May trigger allergies.
2. Can clog pores

Table 1: Lotion Ingredients [5]

Category	Ingredients
1.) Emollients	Water, Cetyl Esters, Glyceryl Dilaurate
2.) Emulsifiers	Cetearyl Alcohol, Cetyl Alcohol
3.) Fragrances	Fragrance
4.) Humectants	Glycerine
5.) Occlusive	Lanolin Oil, Dimethicone
6.) pH Adjusters	Sodium Hydroxide
7.) Preservatives	Alcohol Denat., Chlorphenamine, Benzyl Alcohol
8.) Solvents	Water, Alcohol Denat.

Tridax procumbens:

Tridax Procumbens is in the daisy family which are flowering plant species [3]. Many Ayurveda practitioners are using this plant as a medicine for liver disorders (Saxena and Albert, 2005). The native of the plant is tropical America and naturalized in tropical Africa, Asia, Australia and India. Throughout India, Tridax Procumbens is distributed and is also found along roadsides, meadows, waste grounds, railroads, riverbanks, dikes and dunes [5].

Morphological Structure:

Leaves

They are simple, ovate, opposite, exstipulate, lanceolate and they are 3 - 7 cm [15].

Stem

The plant stem is ascending 30-50cm height, branched, sparsely hairy, rooting at nodes.

Flowers

The plant flowers are looking like daisy .The flower is tubular, yellow centered white or yellow

flowers with three-toothed ray florets. It has two types of flower: ray florets and disc florets with basal palcentation. Sometimes the flowers are 3 lobed with long, penduncled heads. Achenes black narrowly obconnical, 2.0-2.5 mm long with feathery pappus [1,2].

Fruit

Fruit is a hard achene covered with stiff hairs and having a feathery. At one end it has plume like white pappus.

Calyx

It is represented by scales or reduced to pappus.

Seed

The plant Seeds have pendulous embryo, endosperm is absent (Jain Ankitaey *et al.*, 2012; Kopperundevi Ramachandran *et al*., 2017).

Botanical Description:

Kingdom **–** Plantae

Sub-kingdom **–** Tracheobionta

Division – Magnoliophyta

Class – Magnoliopsida

Sub-class – Asteridae

Order – Asterales

Family – Asteraceae

Genus – Tridax

Species – procumbens [4, 14].

Vernacular Names:

English - Coat Buttons

Hindi - Ghamra

Sanskrit - Jayanti Veda

Marathi - Dagadi Pala

Tamil - Thata poodu

Malayalam - Chiravanak

Spanish - Cadillp Chisaca

French - Herbe Caille

Chinese - Kotobukigiku (Satish *et al.*, 2012)

MATERIALS AND METHOD

Collection and Identification of plant material

T. procumbens was collected from Satara, Maharashtra. During April 2025 from the areas around the college and my home located in satara. The plant was authenticated by Ms. R. D. Namdas, Department of Botany, Yashwantrao Chavan Institute of Science, Satara. and a voucher specimen stored in their herbarium. The leaves of the plant were washed with running water and were kept for drying in shed and powdered in a mechanical grinder and stored in airtight container [10].

Extraction:

(Aqueous Extraction of Tridax Procumbens)

The coarse powdered material (each 100gm) was soaked in distilled water (500ml) by Maceration techniques for continuous 72hrs and then strained and the concentrate was evaporated on water bath until concentrate (syrupy consistency) is left and then evaporated to dryness [10].

Instruments:

Instruments used for analysis were pH meter, Brookfield viscometer.

Formulation of the herbal antifungal lotion:

The oil phase was prepared by melting stearic acid, cetyl alcohol, triethanolamine, methylparaben and also propyl paraben, glyceryl monostearate, and lanolin. The second stage, the water phase, was prepared by dissolving glycerin in distilled water that has been heated at the same temperature at 70°C[13]. The oil phase was added slowly to the liquid phase, and make them homogenous using mortar pestle, after extract of Tridax Procumbens Leaves was added, and continuously stirring using pestle by hands to make homogenous. Finally, the lotion was prepare (Table 2).

Table 2: Composition of Antifungal Lotion [13]

Ingredients	F 1	F 2	F 3	Function
Tridax Procumbens Leaves Extract	3gm	6gm	8gm	Active Substance
Cetyl Alcohol	3gm	1gm	4gm	Thickener
Steric Acid	6gm	3.96gm	5.20gm	Emulsifier
Triethanolamine	0gm	1.82gm	5gm	Emulsifier, pH adjuster
Lanolin	2gm	2gm	1.15gm	Softener
Glyceryl Monosterate	2gm	0.38gm	1.55gm	Moisturizer
Glycerin	1.15gm	3gm	1.82gm	Humectant
Methyl Paraben	0.1gm	3gm	1.35gm	Preservative
Propyl Paraben	0.08gm	1gm	2.15gm	Preservative
Lime Water	10 drops	10 drops	10 drops	Fragrance
Distilled water	ad 100	ad 100	ad 100	Solvent

Evaluation of the formulated antifungal lotion:

Physicochemical parameter

Physical parameters of prepared lotion formulation such as colour and appearance were visibly observed [12].

Homogeneity

The lotions were tested for homogeneity by visual appearance and by touch.

Viscosity Test

The preparation of Tridax Procumbens Leaf extract lotion is put into the container. Spindle number 64 is installed. Then, turn on the viscometer and make sure that the spindle rotates[6,7]. This test uses a viscometer at a reading of 100 rpm. Observations were made on the viscometer needle, leading to the viscosity scale number, and documentation was carried out. The requirement for suitable viscosity for topical preparations in the form of lotion is 2000-50000 cP (SNI 16-4399-1996)[16, 17]

pH Determination

The lotion was checked for it's pH as it is responsible for the stability and irritability at the application site. The Digital pH Meter was used to determine the pH of the prepared lotion. After that, the results of the scale readings were recorded. Stable pH is in the range of 4.5-6.5[17].

Spreadability Test

Spreadability refers to the ease with which product can be spread without losing it's firmness and determined therapeutic efficiency of herbal antifungal lotion The appropriate amount of Herbal Antifungal Lotion was applied between two slides, and under specified load direction, and the two sides took the time in seconds to slide off. After that diameter was measured, and the lotion distribution was recorded. The spreadability of lotions were ranging from 7.04 ± 0.21 to 8.17 ± 0.16 g.cm/s

$$S = M \times L / T$$

Where, M = weight tied to upper slide, L = length of glass slide, T = time taken to separate the slides

Irritation Test

The irritation test is done on my hand, I observed and assessed the presence or absence of side effects from using Herbal Antifungal Lotion on the skin. The side effects include skin redness, itching, and roughness. This result showed that all ingredients and concentrations of all ingredients were safe.

Stability Test

The stability test of lotion preparations is carried out to determine the physical stability of the lotion using the freeze-thaw technique. All three herbal antifungal lotions were kept alternatively at 20°C and 40°C in freeze-thaw study for stability determination. All the tests were performed three times [9, 11].

RESULTS AND DISCUSSION

Physicochemical studies:

All formulations F1, F2 and F3 were prepared as per Formulation Table. F1 contains 3gm Tridax Procumbens Leaves Extract, F2 contains 6gm Tridax Procumbens Leaves Extract and while F3 contains 8gm Tridax Procumbens Leaves Extract. The results of physicochemical properties such as color, odour, pH are summarized in given below Table. The pH of formulations range from 6.80 to 6.90 that was found to be within the typical skin pH range and did not cause any irritation upon application. The spreadability of formulations are mentioned in given Table 3 and were found to be in controlled range justifying its compatibility with skin and confirming good cosmetological property. The homogeneity test confirms the uniform distribution of antifungal lotion on skin.

Table 3: Physicochemical Evaluation Parameter

Lotion	Colour	Odour	pH	Spreadability (gm x cm/sec.)
F1	Pale Green	Characteristic	6.87 ± 0.2	57.22± 0.40
F2	Pale Green	Characteristic	6.86 ± 0.3	61.38 ± 074
F3	Pale Green	Characteristic	6.92 ± 0.3	50.27 ± 0.90

Viscosity:

The viscosity of the Prepared lotions at various RPM was determined by Brookfield viscometer (LV spindle no 64) is given in Table 4. It showed 3510, 7320 & 780 cps at the 10 RPM, indicating good flowing rate during handling. The viscosity of all formulations is enlisted in the Table. As the speed of rotation increases viscosity of the formulations F1, F2 and F3 decreased. Also, higher viscosity of the lotion reveals more protection from microbial growth.

Table 4: Viscosity Profile of Formulated Antifungal Lotion

Anti-fungal lotion	η (RPM)	η (cps)	η (cps)	η (cps)	η (cps)	η (cps)
	10 RPM	20 RPM	30 RPM	50 RPM	60 RPM	100 RPM
F1	4510	4435	3360	2770	2610	2244
F2	4880	4640	4320	3440	3330	2944
F3	4150	3890	3450	2980	2450	2300

Stability study:

The stability study carried out by the Freeze Thaw Method. In this test is observed that, there is

no any phase separation in the formulation. The Result of the F1, F2, F3 are mention in the following table 5.

Table 5: Stability Evaluation Parameter

Lotion	Stability
Freeze Method Thaw	
F1	Stable
F2	Stable
F3	Stable

CONCLUSION:

In India, most of the people depend on medicinal plants for their well being. This method inexpensive way to defluoridate water. By developing and modulating bio active components of Tridax procumbens become a effective natural drug for various diseases in future. The research focused on formulating a Herbal Antifungal Lotion using plant extracts from Tridax Procumbens Leaves and evaluating their effectiveness in protecting against Fungal infection and Wound healing. Three formulations F1, F2, and F3 were prepared by altering the ingredient ratios and then assessed for their physical and chemical properties.

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