Formulation and Evaluation Topical Cream by Extraction of Sphagneticola Trilobata

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Abstract

Studying traditional medicine is a helpful way to discover potential new drugs**.** *Sphagneticola* is a large group of plants in the Asteraceae family, with around 60 different species**.** One of these, *Sphagneticola trilobata* **(**Linn.**),** has been used for a long time as a traditional herbal remedy in South America, China, Japan, and India to treat various health problems. *Sphagneticola trilobata* (L.) Pruski, known commonly as creeping oxeye, is a fastgrowing herb of the Asteraceae family with a impact of ethnomedicinal use across tropical regions. Traditionally employed in managing bleeding disorders, treating microbial infections, and supporting skin regeneration, the plant is now receiving greater scientific attention. This compiles and organizes botanical characteristics, phytochemical profiles, and pharmacological activity, emphasizing its hemostatic and dermatological regenerative properties. Data from in vitro and in vivo models reveal antioxidant, antimicrobial, antiinflammatory, cytotoxic, hepatoprotective, and antidiabetic effects. The paper also discusses extraction methods, merits and applications.

Keywords: *Sphagneticola trilobata (Linn),* ethnomedicinal use, phytochemical profile,

Introduction

Sphagneticola trilobata is a fast-growing plant with bright yellow daisy-like flowers, commonly found in tropical and subtropical regions.[1] It is known by many names such as creeping daisy and trailing daisy. The plant contains several bioactive compounds and shows important activities like anti-inflammatory, antimicrobial, wound-healing, and blood-clotting effects.[2,3] Although it is traditionally used for treating cuts and wounds, there is limited scientific data to support these uses, making further study important.[4] It may serve as a safer natural alternative to synthetic coagulants, which can cause allergies, toxicity, and delayed healing. [5]

Materials and Methodology

Method used for extraction: Fresh *Sphagneticola trilobata* leaf,

after being collected, were cleaned

with water, dried naturally, grounded into fine powder and stored at 4℃. For the extraction, a simple maceration process was utilized. Briefly, 30g of dry plant powder was soaked in methanol, ethanol 60%, or ethanol 96% with a raw material or solvent ratio of 1:60 (w/v) for 72hr. Then, the sample was sonicated at 50℃ for 60 min in triplicate, with the same raw materials or solvent ratio. The extracts were then filtered thrice and the solutions were evaporated using the evaporator at low pressure and 45℃. The extraction efficiency was calculated.[6]

Table 1: Formulation chart for cream

INGRIDIENTS	**F1 % (w/w)**	**F2 %(w/w)**	**F3 %(w/w)**	**FUNCTION**
Plant extract	0.5	1	1.5	Active ingredient
Purified water	56.9	56.4	55.9	Aqueous phase
Glycerin	5	5	5	Humectant
Potassium sorbate	0.1	0.1	0.1	Preservative
Mineral oil	10	10	10	Emollient (oil phase)
White Petrolatum	10	10	10	Occlusive/emollient
Glyceryl monostearate	8	8	8	Emulsifier (oil phase)
Cetyl alcohol	4	4	4	Thickener/emulsifier phase
Stearic acid	5	5	5	Co-emulsifier
Triethanolamine(TEA)	0.5	0.5	0.5	pH adjuster, neutralizer

EVALUATION PARAMETER OF CREAM:

1. pH of the cream: Calibrating the pH meter with standard buffer solution, 1 gm of cream are dissolved in 9 ml of distilled water and its pH is measured.[7]

2. Viscosity: Viscosity of the formulations is determined by Viscometer at different rpm and hence rheological properties are assessed.[8]

3. Spread ability studies: It indicates the ease with which the formulation spreads on the skin surface.[9] Calculating formula for spread ability studies using

S = ml/tm = weight of the upper slide. l = length of the glass slide.
t = time taken (second).

4. Microbial test studies: The microbial limit test for formulation using a basic agar medium performed to identify and quantify microorganisms present in the formulation and hence TYMC and pathogen test are done.[5,10]

Results and Discussion

Table 2: Physical properties of extract

SL. NO	PARAMETER	F1	F2	F3
1.	Color	Dark Green	Dark green	Dark green
2.	State	Semisolid slurry	Semisolid slurry	Semisolid slurry
3.	Odor	Herbal/Earthy	Herbal/Earthy	Herbal/Earthy

Fig 1: Physical properties of extract

The organoleptic evaluation like general colour, state, and odour of extract was evaluated. It was found that extract had dark green colour, herbal and earthy odour, along with semisolid slurry. The obtained results are shown in the table.

Table 3: Physical properties of cream

SI.NO	PARAMETER	F1	F2	F3
1	Colour	Light green	Light green	Light green
2	Odour	Herbal/ Earthy	Herbal/ Earthy	Herbal/ Earthy
3	Spread ability	Uniform distribution	Uniform distribution	Uniform distribution
4	Consistency	Medium to thick cream	Medium to thick cream	Medium to thick cream

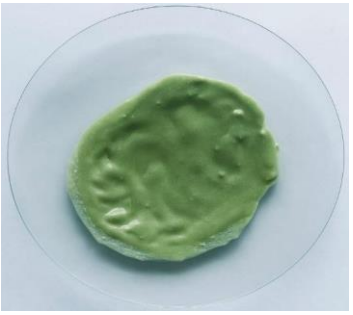


Fig 2: Physical properties of cream

The organoleptic evaluation like general colour, consistency, and odour of cream was evaluated. It was found that cream had herbal and earthy odour, medium to thick consistency, along with uniform spread ability and creamy white to light green in colour. The obtained results are shown in the table.

Table 4: TEST FOR pH

SL.NO	FORMULATION	pH
01	F1	5.68
02	F2	5.70
03	F3	5.74

Fig 3: pH test for cream

The trials were performed on three formulations. The pH of formulations in trials was found to be: F1-5.68, F2-5.70, F3- 5.74. The ideal pH of cream on skin is 5.6 to 6.9. The obtained result of F1, F2 and F3 matches the ideal pH of cream.

Table 5: Spread ability test of cream

Formulation	Spread ability ($gm.cm^2/sec$)
F1	14.2
F2	14.8
F3	14.4

Avg = 14.4

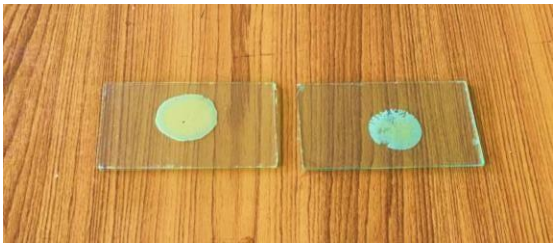


Fig 4: Spread ability test of cream

The spread ability of three formulations was determined and it was observed that formulation F3 has greater spread ability when compared with other formulations. The spread ability of the cream (F3) was found to be 14.8 $gm.cm^2/sec$.

Table 6: Viscosity test of cream

FORMULATION	Spindle	Speed (rpm)	Temperature (ºC)	Viscosity(Cp) Mean ± SD)	Torque (%)
F_1	LV#4	5	25	6800 ± 1200	32-26
F_2	LV#4	10	25	32000± 900	22-28
F_3	LV#4	20	25	45200 ± 1100	28-34

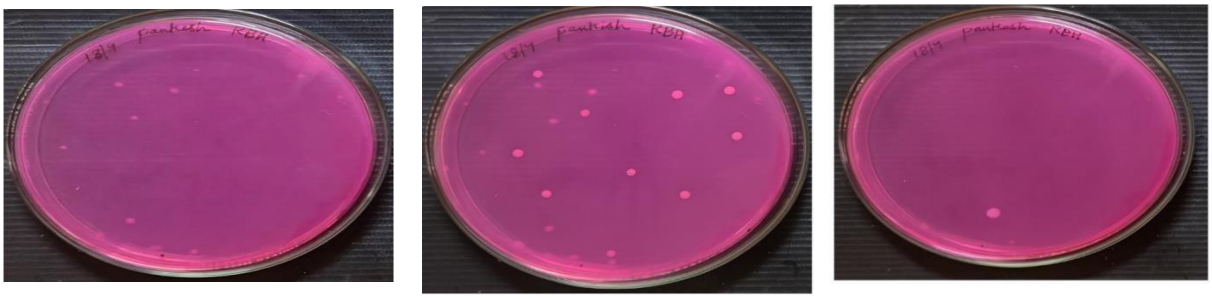
Viscosity measurements using Brookfield viscometer (LV #4 spindle at 25 ºC) revealed a value of 45200 ± 1100 Cp at 10 rpm, with higher viscosity at low shear and lower viscosity at higher shear.

This confirms pseudo plastic nature of the cream desired for topical application as it provides both stability and ease of application during use.

Fig 5: Viscosity test of cream

Table 7: Total Yeast and Mould Count (TYMC)

Formulation	Media	Viable count(CFU/g)	Acceptance criteria
F1	Rose Bengal Agar	17±2.31	≤100
F2	Rose Bengal Agar	25±3.32	≤100
F3	Rose Bengal Agar	14±1.45	≤100



F1 **F2** **F3**

Fig 6: Microbial test of cream using Rose Bengal Agar

Table 8: Pathogen Test

Formulation	Media	Viable count (CFU/G)
F1	Total coliform count (EMB agar-total bacterial count)	0
F2	Total coliform count (EMB agar-total bacterial count)	0
F3	Total coliform count (EMB agar-total bacterial count)	0

F1 **F2** **F3**

Fig 7: Pathogen test of cream using EMB agar

Table 9: Pathogen Test

FORMULATION	MEDIA	VIABLE COUNT (CFU/g)
F1	Total S.aureus count (Braid parker media)	2 ± 0
F2	Total S.aureus count (Braid parker media)	0 ± 0
F3	Total S.aureus count (Braid parker media)	0 ± 0

F1 **F2** **F3**

Fig 8: Pathogen test of cream using Braid parker agar

Table 10: Pathogen Test

FORMULATION	MEDIA	VIABLE COUNT (CFU/g)
F1	Total bacterial count	2 ± 0
F2	Total bacterial count	4 ± 0
F3	Total bacterial count	0 ± 0

F1 **F2** **F3**

Fig 9: Pathogen test of cream using Nutrient agar

Discussion

The various physiochemical properties of the prepared herbal cream are listed above. From the results it is clear that the cream shows good creaming property. The pH of all formulations was in the range compatible with normal pH range of the skin. The rheological behaviors of the cream formulations were also studied with Brookfield viscometer. The results indicated the viscosity of the cream formulations was consistent and also has good spread ability property. The cream sample successfully passes the microbial evaluation. Its low TYMC count combined with low and absence of the specified pathogens confirms that the sample is safe for use and of quality standard. The cream formulation has all the desirable properties that must be present in an ideal cream formulation.

CONCLUSION

Sphagneticola trilobata cream is a safe, natural, and effective topical formulation. The phytochemicals present in the plant contribute to wound healing, antimicrobial protection, and overall skin repair. The formulated cream demonstrated good desirable texture, and suitability for regular skin application. Overall, it presents a promising alternative to conventional synthetic formulations. However, further in-vivo and long-term studies are required to fully confirm its therapeutic potential.

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