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Research Article

Formulation and Pharmacological Evaluation of a Herbal Ointment Containing Blepharis repens for Topical Therapeutic Applications

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ARTICLEINFO

ABSTRACT

Blepharis repens, commonly known as Hadsan in Marathi, is a medicinal herb from the Acanthaceae family, predominantly found in arid and rocky regions of India. Traditionally, it is utilized in managing bone fractures, dermatological conditions, urinary disorders, and allergic reactions. In the present study, an herbal ointment was formulated using the fusion method from various parts of Blepharis repens, focusing on its wound-healing potential. The formulation was systematically evaluated for its physicochemical properties, stability, and therapeutic relevance. Phytochemical screening revealed the presence of bioactive compounds including flavonoids, tannins, and saponins, known for their anti-inflammatory, antioxidant, and regenerative activities. Notably, the leaves exhibited significant wound-healing and anti-inflammatory effects, while the roots demonstrated bone-regenerative properties. These findings provide preliminary scientific support for the traditional topical use of Blepharis repens and underscore its potential in herbal dermatological formulations.

Keywords: Blepharis repens, Herbal ointment, Wound healing, Fusion method, Phytochemical screening

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1. Introduction

The resurgence of interest in herbal medicines has prompted extensive research into traditional plants with therapeutic potential. Blepharis repens (Burm.f.) Alston, a lesser-known yet potent medicinal herb from the Acanthaceae family, is traditionally referred to as "Hadsan" in Marathi. It is commonly found in arid and rocky terrains of India and has long been utilized in folk medicine to treat a range of ailments including bone fractures, skin disorders, urinary complications, and allergic reactions [1-3].

All parts of Blepharis repens—roots, stems, and leaves—possess medicinal properties. Notably, the leaves are rich in phytoconstituents that demonstrate anti-inflammatory, antioxidant, and wound-healing activities [4]. The roots are traditionally acclaimed for their role in accelerating the healing of bone fractures. Despite its historical use, limited scientific studies have been conducted to validate and standardize topical formulations of this plant [5].

Topical drug delivery through herbal ointments offers several advantages such as localized effect, minimal systemic absorption, and reduced side effects. In this study, an ointment was formulated using the fusion method incorporating Blepharis repens extract, and subjected to physicochemical and phytochemical evaluations [6-8]. The objective was to explore and substantiate the plant's potential in wound management and skin regeneration through a standardized, reproducible formulation.

This research aims to bridge the gap between traditional knowledge and modern pharmaceutical science by providing preliminary scientific validation for the use of Blepharis repens in topical applications [9].

2. Material and Method

2.1 Material

Blepharis repens, a traditionally used medicinal herb, was collected from the arid regions of Marathwada and Vidarbha in Maharashtra, India. The plant material included aerial parts such as leaves, stems, and roots. Pharmaceutical-grade ingredients including white soft paraffin, yellow soft paraffin, beeswax, methylparaben, and purified water were procured from authorized suppliers and used as received without further purification [10].

2.2 Authentication

The collected plant material was authenticated by a qualified botanist. A voucher specimen was prepared and deposited in a recognized herbarium for future reference. The authentication confirmed the plant species as Blepharis repens (Burm.f.) Alston, belonging to the family Acanthaceae [11].

2.3 Preparation of Plant Extract

The collected plant material was initially cleaned under running tap water to remove soil, dust, and other contaminants. After cleaning, the material was shade dried at room temperature for 3 to 4 days to retain its phytoconstituents. The dried herb was then coarsely powdered using a mortar and pestle. For extraction, 10 g of powdered Blepharis repens was boiled in 100 mL of distilled water in a conical flask for 3 to 4 hours with intermittent shaking. After the boiling process, the mixture was filtered using standard filtration techniques, and the clear filtrate was collected. The extract was allowed to cool to room temperature and stored in an airtight container until further use in formulation [12].

2.4 Formulation of Herbal Ointment

The ointment was formulated using the fusion method. All glassware used in the process was thoroughly cleaned and dried as per standard operating procedures. A measured quantity (3 mL) of Blepharis repens extract was placed in a sterile beaker. White soft paraffin (12 g) was melted and mixed into the extract under continuous stirring. Subsequently, melted yellow soft paraffin (8 g) and beeswax (6 g) were added sequentially with continuous agitation to ensure a uniform blend. Methylparaben (0.2 g), serving as a preservative, was incorporated into the mixture during the final stage of blending. The resulting semi-solid formulation was stirred thoroughly until a homogeneous consistency was achieved. The ointment was then allowed to cool and was transferred into clean, well-labeled airtight containers for storage and further evaluation [13].

2.5 Composition of the Formulation (F1)

The herbal ointment was prepared using the fusion method by incorporating the aqueous extract of Blepharis repens with a suitable base composed of white soft paraffin, yellow soft paraffin, and beeswax. Methylparaben was added as a preservative to enhance the formulation's shelf life. The ingredients were selected based on their emulsifying and skin-compatible properties. The final formulation (F1) was designed to deliver optimal consistency, stability, and therapeutic efficacy. The detailed composition of the prepared herbal ointment is presented in Table 1 [14,15].

Table 1: Composition of Blepharis repens Herbal Ointment (F1)

Sr. No.	Ingredients	Quantity (F1)
1	*Blepharis repens* extract	3 mL
2	White soft paraffin	12 g
3	Yellow soft paraffin	8 g
4	Beeswax	6 g
5	Methylparaben	0.2 g
6	Purified Water	up to 30 mL

3. Results and Discussion

3.1 Phytochemical Screening of Blepharis repens

The preliminary phytochemical analysis of the aqueous extract of Blepharis repens revealed the presence of important secondary metabolites such as tannins, alkaloids, and flavonoids. These compounds are well-documented for their roles in wound healing, antioxidant activity, and anti-inflammatory effects, which support the traditional therapeutic claims of the plant. The results of the phytochemical tests are summarized in Table 2, where positive reactions are shown for ferric chloride (tannins), Dragendorff's reagent (alkaloids), and sodium hydroxide (flavonoids). The visual results of the screening procedure are also depicted in Figure 1, illustrating the characteristic color changes observed during each test.

Table 2: Phytochemical Screening of Blepharis repens Extract

Test	Reagents Used	Observation	Inference
Ferric chloride test	Extract + $FeCl_3$	Black precipitate	Tannins present
Dragendorff's test	Extract + Dragendorff's reagent	Reddish-brown precipitate	Alkaloids present
Sodium hydroxide test	Extract + NaOH	Orange coloration	Flavonoids present

Figure 1: Phytochemical screening of *Blepharis repens* extract

3.2 Evaluation of Herbal Ointment

The formulated herbal ointment (F1) was subjected to several evaluation parameters to determine its physical and functional suitability for topical application. The formulation showed a yellowish appearance, smooth homogeneity, and acceptable spreadability. The pH of the formulation was measured to be 6.5, which is within the range suitable for human skin, ensuring non-irritant and safe application. No signs of skin irritation were observed in preliminary testing (Table 3, Figure 2).

Table 3: Evaluation Parameters of Blepharis repens Herbal Ointment (F1)

Parameter	Observation
Physical Appearance	Yellowish
pH	6.5
Homogeneity	Good
Spreadability	Good
Skin Irritation	Absent

Figure 2: Prepared *Blepharis repens* herbal ointment (F1)

3.3 Evaluation Methodology Overview

Physical Appearance

The color, odor, and consistency of the formulation were examined visually. The ointment displayed a characteristic yellowish color and a pleasant herbal odor, with a uniform semi-solid consistency suitable for topical application.

pH Measurement

The pH of the herbal ointment was evaluated using a calibrated digital pH meter. The pH value of 6.5 indicates good compatibility with the skin, minimizing the risk of irritation or allergic reactions.

Homogeneity Test

A small quantity of ointment was rubbed between the thumb and forefinger to evaluate texture. The formulation exhibited good homogeneity without grittiness, indicating even distribution of plant extract and excipients.

Viscosity

The viscosity of the herbal ointment was measured using the rotational viscometer method, which is appropriate for semi-solid formulations. The consistency was found to be suitable for easy application and adherence to the skin.

Stability Testing

Initial chemical stability assessment included observation for any phase separation, color change, or degradation over time. The formulation remained stable under ambient conditions during the short-term observation period. Quantitative estimation and long-term stability studies are suggested for future work.

4. Conclusion

The present study successfully demonstrated the formulation and evaluation of a herbal ointment prepared from Blepharis repens, a traditionally used medicinal plant. The phytochemical screening confirmed the presence of bioactive compounds such as tannins, flavonoids, and alkaloids, which are known to contribute to wound healing, anti-inflammatory, and antioxidant activities. The formulated ointment exhibited acceptable physical characteristics, including appropriate pH, good homogeneity, desirable spreadability, and no signs of skin irritation. These findings support the potential of Blepharis repens ointment as a

promising natural therapeutic agent for topical application in wound care. Further in-vivo studies and clinical evaluations are recommended to validate its efficacy and safety on a broader scale.

Conflict of Interest

The authors declare no conflict of interest.

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