



TRIDAX PROCUMBENS topical cream

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ABSTRACT :

Tridax procumbens L. (Asteraceae) is a common medicinal plant found throughout tropical and subtropical regions, frequently utilized in traditional medicine for its wound healing, haemostatic, anti-inflammatory, and antimicrobial properties. Recent scientific studies have increasingly supported these traditional uses, identifying a diverse range of bioactive compounds in the plant—including flavonoids, phenolics, sterols, saponins, and triterpenes—which demonstrate notable antioxidant, anti-inflammatory, antimicrobial, and tissue-regenerative effects.

This review systematically examines and synthesizes the available literature on *Tridax procumbens*, with a particular focus on its potential pharmaceutical applications in topical semi-solid dosage forms such as creams, gels, and ointments. It outlines a detailed methodology for preparing an oil-in-water cream incorporating *T. procumbens* extract. The mechanisms underlying its wound healing, antimicrobial, antioxidant, and anti-inflammatory activities are explored, alongside a discussion of current and potential clinical and cosmetic uses.

Additionally, the review identifies existing gaps in knowledge and recommends directions for future research, such as standardization of extracts, further mechanistic studies, optimization of formulation strategies, comprehensive safety assessments, and robust controlled clinical trials. With continued rigorous investigation and development, *Tridax procumbens* shows significant promise as an affordable, plant-based therapeutic agent for dermatological and wound care applications.

Keywords : *Tridax procumbens* , Phytopharmaceutical Wound healing , Topical cream formulation, Antimicrobial , Anti-inflammatory , Mechanism of action , Drug development

INTRODUCTION

Tridax procumbens Linn., commonly referred to as “Coat Buttons” or “Tridax Daisy,” is a widespread member of the Asteraceae family. This species is prevalent in tropical and subtropical regions, particularly across India, Africa, and South America. Within the context of traditional Indian medicine—specifically Ayurveda—*T. procumbens* has long been utilized in the management of wounds, cuts, ulcers, inflammation, and skin infections. The plant is recognized for its antimicrobial, antioxidant, anti-inflammatory, and haemostatic activities.

Phytochemical studies have demonstrated that *T. procumbens* contains a diverse array of bioactive compounds, including flavonoids, alkaloids, tannins, saponins, carotenoids, and terpenoids. Notably, flavonoids and phenolic compounds contribute significantly to its pharmacological effects, particularly in scavenging free radicals, enhancing collagen synthesis, and promoting wound healing.

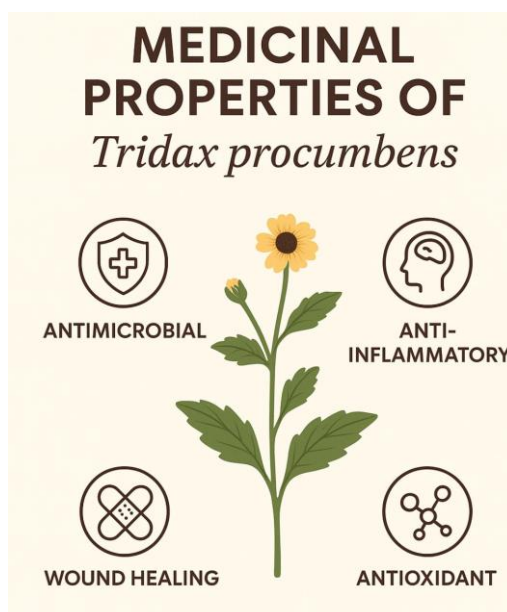
T. procumbens has garnered considerable interest in recent years due to its broad spectrum of biological activities and ready availability. Researchers have increasingly investigated its integration into various modern pharmaceutical dosage forms, including creams, gels, and ointments intended for topical application. The ongoing development of well-validated and standardized formulations utilizing *T. Procumbens* offers promising potential as a cost-effective, plant-based alternative for wound care and dermatological applications.



* *Phytochemical Components of Tridax procumbens* *

Tridax procumbens contains a variety of bioactive phytochemicals responsible for its medicinal properties. These include:

1. **Flavonoids** – e.g., quercetin, luteolin
2. **Alkaloids** – various nitrogen-containing compounds
3. **Tannins** – phenolic compounds with astringent and antimicrobial effects
4. **Saponins** – surface-active compounds with anti-inflammatory and wound-healing properties
5. **Steroids / Terpenoids** – e.g., oleanolic acid, triterpenes
6. **Carotenoids** – natural antioxidants
7. **Phenolic compounds** – contribute to antioxidant and antimicrobial activity
8. **Essential oils** – minor components with antimicrobial and aromatic properties



Medicinal Parts of Tridax procumbens

Different parts of the plant are used in traditional and modern medicine, mainly leaves, flowers, and whole plant:
Plant Part Medicinal Properties / Uses

Leaves : Most commonly used. Possess wound healing, anti-inflammatory, antimicrobial, antioxidant, and hemostatic properties. Used in topical formulations like pastes, creams, and gels.

Flowers : Contain flavonoids and phenolic compounds; used for antimicrobial, anti-inflammatory, and sometimes cosmetic purposes.

Whole Plant / Aerial Parts : Used traditionally for cuts, burns, ulcers, fever, and diabetes. Contains a combination of all bioactive compounds.

Roots : Less commonly used; sometimes used in traditional decoctions for digestive or anti-inflammatory purposes.

Various dosage forms of Tridax procumbens

Tridax procumbens extracts have been incorporated into various pharmaceutical dosage forms to harness their wound healing, antimicrobial, anti-inflammatory, and antioxidant activities. Research articles and experimental studies have documented several of these formulations. The reported dosage forms include

- :
- 1) Crude extract
 - 2) Powder
 - 3) Juice
 - 4) Herbal paste
 - 5) Ointment
 - 6) Creams
 - 7) Gels
 - 8) Lotions

- 9) Oil infusions
- 10) Tablet & Capsule
- 11) Mouthwash
- 12) Transdermal patches

*** TRIDAX PROCUMBENS CREAM ***

Tridax procumbens cream is a topical preparation, formulated by integrating an extract of Tridax procumbens into either an oil-in-water or water-in-oil cream base. This approach is intended for direct application to the skin, harnessing the therapeutic benefits attributed to the plant in a format that is both stable and readily absorbed.

The formulation facilitates targeted delivery of active constituents—namely flavonoids, phenolics, saponins, and alkaloids—each recognized for their respective wound healing, antimicrobial, anti-inflammatory, and antioxidant effects. Compared to traditional applications such as crude pastes or plant juices, the cream provides improved stability, enhanced penetration through the skin, greater user compliance, and a more favorable cosmetic profile.

Preparation of Tridax procumbens Leaf Extract

- Materials Needed
- Fresh Tridax procumbens leaves (authenticated)
- Solvent: Ethanol, Methanol, or
- Hydroalcoholic mixture (50:50)
- Distilled water
- Soxhlet apparatus or maceration setup
- Rotary evaporator (for solvent removal)
- Grinder or mortar & pestle
- Filter paper

Step 1: Collection and Cleaning

1. Collect healthy, fresh leaves of Tridax procumbens.
2. Wash thoroughly with running water to remove dirt and impurities.
3. Shade-dry the leaves for 7–10 days or until fully dry. Avoid direct sunlight to prevent degradation of active compounds.

Step 2: Powdering

1. Grind the dried leaves into a coarse or fine powder using a grinder or mortar & pestle.
2. Store the powdered leaves in an airtight container, away from light and moisture.

Step 3: Extraction

Maceration (Simpler Method)

1. Soak 50 g of leaf powder in 500 mL of solvent.
2. Leave it at room temperature for 48–72 hours, shaking occasionally.
3. Filter the mixture using Whatman filter paper.

Step 4: Concentration

1. Remove the solvent using a rotary evaporator under reduced pressure.
2. Concentrate the extract to a thick, semi-solid mass.

Step 5: Drying

For a powdered extract, dry the concentrated extract in a vacuum oven at 40–45°C. Store in an airtight container in a cool, dark place.

Step 6: Standardization

1. Test for phytochemical constituents: flavonoids, tannins, saponins, alkaloids, phenols.
2. Measure total flavonoid content or phenolic content to ensure batch-to-batch consistency.

Innovative Formulation of Tridax procumbens Topical Cream

Table: Formulation of Tridax procumbens Cream

Sr. No	Ingredients	Quantity (% w/w)	Purpose/Function
1	Tridax procumbens		

	Leaf Extrac.	10.0		Active ingredient (wound healing, antimicrobial, anti-inflammatory)
2	Emulsifying Wax NF	6.0		Emulsifier and stabilizer
3	Cetyl Alcohol		2.0	Thickener and emollient
4	Glycerin	4.0		Humectant, retains skin moisture
5	Sodium Chloride	0.5		Viscosity enhancer, stabilizer
6	Distilled Water	q.s. to 100		Vehicle (aqueous phase)
7	Phenoxyethanol	0.8		Preservative (antimicrobial agent)
8	Ethylhexylglycerin	0.2		Preservative booster and skin conditioner

Preparation Method

1. Phase A (Oil Phase):

Heat the Emulsifying Wax NF, Cetyl Alcohol, and Glycerin in a water bath to 70°C until fully melted and homogeneous.

2. Phase B (Aqueous Phase):

Heat the Distilled Water to 70°C in a separate container.

3. Emulsification:

Slowly add Phase B to Phase A with continuous stirring to form the emulsion. Maintain the temperature and stirring until the mixture cools to 40°C.

4. Incorporation of Active Ingredients:

Add the standardized *Tridax procumbens* leaf extract to the emulsion. Stir until uniformly dispersed.

5. Addition of Preservatives and Additives:

Add Phenoxyethanol, Ethylhexylglycerin, Allantoin, and Vitamin E Acetate to the mixture. Stir until completely dissolved.

6. Final Adjustments:

Adjust the pH of the cream to 5.5–6.5 using a pH meter.

Ensure the cream is homogeneous and free from air bubbles.

7. Packaging:

Transfer the cream into sterilized containers and seal properly. Store in a cool, dry place.

Mechanism of Action of *Tridax procumbens* Topical Cream

The therapeutic activity of *Tridax procumbens* cream is mainly due to the synergistic effects of its bioactive compounds — flavonoids, alkaloids, tannins, and saponins — when applied topically on the skin.

1) Wound healing

Flavonoids and tannins actively promote wound healing by stimulating fibroblast proliferation, boosting collagen production, and encouraging new epithelial growth, collectively accelerating wound closure. The extract further facilitates angiogenesis, so there's an increased formation of new blood vessels, which enhances the delivery of oxygen and nutrients at the wound site. When present, allantoin and glycerin help keep the environment moist—an essential factor for optimal cell migration and tissue repair. Altogether, these mechanisms work in concert to speed up wound contraction and improve the tensile strength of the newly healed tissue.

1. Anti-inflammatory Mechanism

Flavonoids and triterpenoids interfere with enzymes such as cyclooxygenase (COX) and lipoxygenase (LOX), leading to decreased production of inflammatory mediators like prostaglandins and leukotrienes. This biochemical action results in diminished redness, swelling, and pain at the site of application. Ultimately, these compounds contribute to the suppression of the inflammatory response and provide relief from discomfort.

2. Antimicrobial Mechanism

Tannins and alkaloids act by precipitating microbial proteins and compromising the structural integrity of bacterial and fungal cell walls. Flavonoids, in contrast, disrupt bacterial membrane permeability, resulting in the leakage of intracellular contents. These biochemical actions collectively contribute to the prevention of infections in wounds or skin lesions. The overall outcome is the inhibition of growth for pathogens such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Candida albicans*.

3. Antioxidant Mechanism

Phenolic compounds and flavonoids function as antioxidants, neutralizing reactive oxygen species (ROS) produced during inflammatory processes and tissue injury. This activity mitigates oxidative stress, safeguards skin cells, and facilitates more efficient wound healing. In essence, these compounds support cellular protection and promote faster tissue recovery.

4. Skin Conditioning and Moisturizing Effect

Glycerin serves as a humectant by drawing water molecules into the outermost layer of the skin, thereby preventing dehydration. Emulsifying wax and cetyl alcohol contribute by forming a protective barrier that retains this moisture. The combined effect is smoother, well-hydrated skin, which in turn

optimizes the absorption of active ingredients.

Innovation and applications

The development of a topical cream using *Tridax procumbens* marks a noteworthy progression in merging traditional herbal knowledge with current pharmaceutical practices. Transforming such an accessible medicinal plant into a standardized pharmaceutical product demonstrates the potential for traditional remedies to be incorporated into mainstream healthcare. By offering a plant-based alternative to synthetic wound-care agents, the cream addresses safety concerns—reducing the likelihood of allergic reactions or irritation commonly associated with synthetic options. Importantly, standardizing the *Tridax* extract ensures consistent pharmacological activity, which is crucial for therapeutic dependability and quality assurance in pharmaceutical manufacturing.

From a therapeutic perspective, this formulation's versatility is evident. Its wound-healing, anti-inflammatory, antioxidant, and antimicrobial properties make it suitable for managing cuts, burns, ulcers, acne, and post-surgical wounds. The cream encourages collagen synthesis and epithelial repair while providing protection against microbial threats. Additionally, its emollient and soothing properties enhance its value in dermatological and cosmetic applications, supporting management of minor skin complaints, dryness, and irritation. Its formulation is designed to promote optimal absorption and skin penetration, facilitating efficient and reliable therapeutic outcomes.

Innovative aspects of the formulation

This advanced *Tridax procumbens* cream stands apart from conventional herbal formulations due to its rigorously optimized composition and scientifically selected ingredients. The formulation employs a standardized ethanolic extract at 10%, ensuring reproducible concentrations of bioactive flavonoids and phenolics, which are widely recognized for their therapeutic properties.

The cream utilizes an oil-in-water emulsion base incorporating emulsifying wax, cetyl alcohol, and glycerin, providing a non-sticky, smooth texture and facilitating enhanced absorption and hydration. For preservation, phenoxyethanol and ethylhexylglycerin have been included, delivering broad-spectrum antimicrobial protection while omitting synthetic parabens—thereby enhancing both skin compatibility and environmental safety.

Importantly, the product is carefully adjusted to a physiological pH (5.5–6.5), aligning with the skin's natural barrier to reduce irritation and improve user comfort. Its dual-action mechanism—simultaneously promoting moisture retention and supporting accelerated healing—clearly differentiates it from standard herbal creams. Furthermore, all ingredients are sourced from renewable and biodegradable materials, underscoring the formulation's sustainability and environmental responsibility.

Recommendations for future research and development

To advance the development of *Tridax procumbens* cream, rigorous clinical and pharmacokinetic studies are essential to confirm both its therapeutic efficacy and safety in human subjects. Traditional formulations may have limitations, so exploring advanced delivery systems—such as nanoemulsions, liposomes, or hydrogels—could enhance skin penetration and ensure controlled release of active compounds. Additionally, combining *Tridax procumbens* with other compatible herbal extracts may result in synergistic benefits, particularly for wound healing and antioxidant effects.

For commercial viability, further research is necessary in the areas of sustainable cultivation, efficient large-scale extraction, and comprehensive stability testing. Interdisciplinary collaboration among experts in pharmacognosy, pharmaceuticals, and dermatology will be crucial for standardizing, validating, and ultimately establishing *T. procumbens* cream as a reliable, environmentally friendly, and clinically supported herbal dermatological product.

Conclusion:

The topical cream formulated with *Tridax procumbens* stands out as an intriguing example of how traditional herbal remedies and contemporary formulation techniques can complement each other. The preparation demonstrates notable wound-healing abilities, alongside antimicrobial and antioxidant properties, positioning it as a strong contender for use in both medical and cosmetic contexts. While initial results look promising, further investigation and rigorous clinical trials are necessary to fully validate its efficacy and safety. Continued research in this area could ultimately lead to the development of a new generation of herbal skincare products that are both effective and environmentally responsible.