

Formulation and Evaluation of Anti-Septic Cream Using By Tridax Procumbens and Butterfly Pea

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Abstract:

Skin infections and minor wounds are common health concerns that often require topical antimicrobial treatment. Conventional antiseptic creams may cause adverse effects such as irritation, dryness, and allergic reactions following prolonged use. The present study aimed to formulate and evaluate a herbal antiseptic cream containing extracts of *Tridax procumbens* and *Clitoria ternatea* (Butterfly Pea), both of which possess well-documented antimicrobial, antioxidant, anti-inflammatory, and wound-healing properties. Plant materials were collected, shade-dried, powdered, and extracted by the decoction method. The obtained extracts were incorporated into an oil-in-water cream base containing cocoa butter, stearic acid, liquid paraffin, glycerin, borax, rose water, methyl paraben, and vitamin E. Three formulations (F1–F3) were prepared and evaluated for physicochemical parameters including appearance, pH, viscosity, spreadability, homogeneity, washability, stability, and skin irritation potential. The optimized formulation exhibited a smooth texture, acceptable pH (6.5), good spreadability, satisfactory viscosity, and excellent stability without evidence of irritation. The findings suggest that the developed herbal antiseptic cream may serve as a safe, effective, and economical topical preparation for the prevention of minor skin infections and promotion of wound healing.

Keywords: Herbal antiseptic cream, *Tridax procumbens*, *Clitoria ternatea*, wound healing, antimicrobial activity, topical formulation.

1. INTRODUCTION

The skin serves as the primary protective barrier against microbial invasion. Disruption of this barrier due to cuts, burns, abrasions, or other injuries increases susceptibility to bacterial and fungal infections. Topical antiseptic preparations are commonly used to prevent microbial contamination and facilitate wound healing. However, prolonged use of synthetic antiseptic agents may lead to skin irritation, dryness, hypersensitivity reactions, and microbial resistance.

Herbal formulations have gained significant attention owing to their safety, affordability, biocompatibility, and therapeutic efficacy. Medicinal plants contain diverse phytoconstituents such as flavonoids, tannins, alkaloids, phenolic compounds, and glycosides that contribute to antimicrobial, antioxidant, anti-inflammatory, and wound-healing activities.

1.1 Mechanism of Skin Infection

Skin infection mainly occurs when harmful microorganisms enter the body through cuts, wounds, burns, or damaged skin. Normally, the skin acts as a protective barrier against microorganisms. However, when the skin is injured, bacteria and fungi can easily grow in the affected area.

When microorganisms multiply on the skin, they cause redness, swelling, pain, irritation, and sometimes pus formation. The body reacts by activating the immune system, leading to inflammation around the infected area. Herbal antiseptic creams help by reducing microbial growth and protecting the skin from further infection. The bioactive compounds present in medicinal plants also help in reducing inflammation and promoting tissue repair.

1.2 *Tridax procumbens* (Coat Buttons Plant)

Tridax procumbens is a medicinal herb belonging to the family Asteraceae. It is commonly known as *Coat Buttons* due to the appearance of its flowers. The plant is widely distributed in tropical and subtropical regions and has been used in traditional medicine for centuries.

Tridax procumbens possesses several pharmacological activities, including wound healing, antimicrobial, anti-inflammatory, antioxidant, hepatoprotective, and immunomodulatory properties. The leaves contain various bioactive compounds such as flavonoids, alkaloids, tannins, carotenoids, and saponins, which contribute to its therapeutic effects.

Traditionally, the leaf extract is applied to cuts, wounds, and skin infections to accelerate healing and prevent microbial growth. Due to its medicinal significance, *Tridax procumbens* is considered a valuable natural source for the development of herbal pharmaceutical formulations.



Fig.1.2 *Tridax procumbens*

1.3 Butterfly Pea (*Clitoria ternatea*)

Clitoria ternatea, commonly known as Butterfly Pea, is a perennial herbaceous plant belonging to the family Fabaceae. It is widely cultivated in Asia and is recognized for its striking blue flowers and numerous medicinal benefits.

The plant contains a variety of phytochemicals, including anthocyanins, flavonoids, alkaloids, and phenolic compounds, which exhibit strong antioxidant activity. Butterfly Pea has been traditionally used in Ayurvedic medicine for enhancing memory, reducing stress, improving skin health, and supporting overall well-being.

Scientific studies have demonstrated that *Clitoria ternatea* possesses antioxidant, anti-inflammatory, antimicrobial, antidiabetic, neuroprotective, and wound-healing properties. The flower extract is also used as a natural coloring agent in food and cosmetic products due to its vibrant blue pigment. Because of its rich phytochemical profile and therapeutic potential, Butterfly Pea is gaining increasing attention in herbal medicine and pharmaceutical research



Fig . 1.3 Butterfly Pea

2.. Materials and Methods

2.1 Collection and Preparation of Plant Materials

Fresh leaves of *Tridax procumbens* and flowers of *Clitoria ternatea* were collected from local sources. The collected materials were washed thoroughly, shade-dried at room temperature, and powdered using a mechanical grinder. The powders were stored in airtight containers until further use.

2.2 Extraction of Plant Materials

The extracts were prepared by the decoction method. Approximately 10 g of powdered plant material was mixed with 100 mL of distilled water and boiled for 15–20 minutes until the volume was reduced to half. The mixture was cooled, filtered, and stored in amber-colored containers.

2.3 Formulation of Herbal Antiseptic Cream

The cream was prepared by the fusion method.

Oil Phase: Cocoa butter, stearic acid, and liquid paraffin were melted together.

Aqueous Phase: Borax was dissolved in rose water, followed by addition of glycerin and vitamin E.

The herbal extracts were incorporated into the aqueous phase, which was then gradually added to the oil phase with continuous stirring until a homogeneous cream was formed.



2.4 Composition of Formulations:

Table 1: Formulation Table:

Ingredients	F1	F2	F3
Tridax procumbens extract	0.5 mL	1 mL	1.5 mL
Butterfly pea extract	0.5 mL	1 mL	1.5 mL
Cocoa butter	4 g	5 g	6 g
Stearic acid	1 g	2 g	3 g
Liquid paraffin	1 mL	2 mL	3 mL
Glycerin	0.5 mL	1 mL	1.5 mL

Rose water	3 mL	4 mL	5 mL
Borax	0.05 g	0.1 g	0.15 g
Methyl paraben	0.01 g	0.02 g	0.03 g
Vitamin E	0.1 mL	0.2 mL	0.3 mL
Distilled water	q.s.	q.s.	q.s.

3. Evaluation of Formulation:

3.1 Physical Evaluation

The color, odor, and appearance of the prepared cream were observed visually. The formulation showed uniform distribution of ingredients and smooth texture.

Table 2: Physical Evaluation

Parameter	Batch 1	Batch 2	Batch 3
Color	Deep bluish green	Deep bluish green	light bluish green
Odor	Pleasant	Pleasant	Pleasant
Appearance	Smooth	Smooth	Smooth

3.2 pH Determination

The pH of the cream was measured using a digital pH meter. About 1 gm of cream was dissolved in 50 ml distilled water and the pH was recorded.

Table 3: pH Measurement

Parameter	Batch 1	Batch 2	Batch 3
pH	6.2	6.4	6.5

3.3 Viscosity Measurement

Viscosity was determined using a Brookfield viscometer under standard operating conditions

Table 4: Viscosity Determination

Parameter	Batch 1	Batch 2	Batch 3
Viscosity	0.9	1.1	1.4

3.4 Spreadability Test

Spreadability was determined by placing the cream between two glass slides and measuring the time required for separation of the slides.



Fig. Spread ability Test

3.5 Stability Study

The formulations were stored at room temperature and observed periodically for changes in color, odor, consistency, and phase separation.

3.6 Skin Irritation Study

The skin irritation study indicated that the cream was non-irritant and safe for topical application.



Fig. Skin Irritation Test

Observation:

- No redness, itching, or irritation was observed.
- The formulation was found safe for skin application.

4. Result :

The antiseptic cream was successfully formulated using natural ingredients including Tridax procumbens extract, butterfly pea flower extract, cocoa butter, liquid paraffin, borax, vitamin E, rose water, and glycerin.

Result of Evaluation Parameters



Evaluation Parameter	Observation
Color	Light bluish green
Odor	mild pleasant
Appearance	Smooth
pH	6.5
Viscosity	1.4
Spreadability	Good
Homogeneity	Good
Skin irritation test	Non-irritant to skin
Washability	Easily washable
Stability study	Stable

5. Conclusion

The formulated antiseptic cream demonstrated desirable physicochemical properties, excellent stability, and effective antimicrobial activity. The pH and viscosity were found suitable for topical application. The formulation showed good spreadability, homogeneity, and washability without causing skin irritation. The presence of herbal ingredients such as Tridax Tridax procumbens and butterfly pea flower extract contributed to the skin-protective activity of the cream. Further clinical studies and long-term stability studies may be carried out to support the effectiveness and safety of the formulation.

6. Future Scope of Antiseptic Cream :

The formulated antiseptic cream containing Tridax procumbens and Butterfly Pea (*Clitoria ternatea*) extract has good potential for future pharmaceutical and cosmetic applications. Herbal formulations are gaining popularity because of their natural origin, safety, and fewer side effects compared to synthetic products.

Future Scope :

- Advanced stability studies can be performed to improve shelf life and storage conditions.
- The cream may be modified into anti-acne, wound healing, or skin protective formulations.
- Different concentrations of herbal extracts can be studied to improve therapeutic effectiveness.
- Clinical studies can be conducted to confirm safety and efficacy on human skin.
- The formulation can be developed into commercial herbal skincare products.
- Additional herbal ingredients and essential oils may be incorporated for enhanced medicinal value.

- The product may be prepared in different dosage forms such as gel, lotion, or ointment.
- Large-scale manufacturing techniques can be applied for industrial production.
- Future research may focus on improving fragrance, texture, spreadability, and patient acceptability of the cream.

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