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FORMULATION AND EVALUATION OF HERBAL WOUND HEALING CREAM CONTAINING TRIDAX PROCUMBEN AND JATROPHA CURCUS

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ABSTRACT

Wound healing is a cellular and biochemical process of restoring normal structure functions of damaged tissue. Healing is a natural phenomenon by which body itself overcome the damaged to the tissue but the rate of healing is veritably slow and chance of microbial infection is high. enhancement in healing process can be negotiate either the time needed for mending or to minimize the uninvited consequences. India has a rich tradition of herbs predicated knowledge on healthcare system. Several medicinal herbs proved to be a wound healer were related and formulated for treatment and direction of injuries. Various herbal products have been used in operation and treatment of injuries over the times. The present research attempt to emphasizes on formulation of a wound healing dosage form using herbal drug extracts of *Jatropha Curcus* and *Tridax procumbens*.

KEYWORDS: Herbal Wound Healing Cream, *Tridax Procumbens*, *Jatropha Curcus*.

INTRODUCTION

Creams are defined as viscous liquids or semi -solid emulsions, which can be either oil - in- water or water - in- oil types. They are widely employed in both medicinal and cosmetic applications, serving to cleanse, beautify, and improve the skin's appearance. When applied to skin or living tissue, natural antiseptic herbs can either eliminate or stop the bacterial growth, lowering the risk of sepsis and other infections. Topical skin infections, despite the availability of numerous antimicrobial agents, continue to present significant therapeutic challenges. Gram -positive bacteria such as Staphylococcus aureus are responsible for common infections such as postoperative wound infections, toxic shock syndrome, endocarditis, and osteomyelitis, while gram-negative bacteria including Escherichia coli cause conditions such as septicemia, cholecystitis, and lower urinary tract infections. Additionally, Pseudomonas aeruginosa has b een implicated in a range of infections, including septicemia, otitis media, wound infections, and urinary tract infections. These trends highlight the growing need for alternative treatments, including the use of medicinal plants.Research has increasingly focused on the antimicrobial properties of plants as potential alternatives to synthetic antibiotics. Among these, Jatropha curcus, Ran erand, stands out for its powerful antibacterial, antifungal, anti -inflammatory, and astringent properties. Externally, the powdered bark of A Jatropha is applied for stoppingbleeding, while a decoction of the bark is used as a gargle for treating sore throats, coughs, and hoarseness.Additionally, the paste of the bark is used for skin diseases, wounds, and different skin affections. The plant's pharmacological effects include antipyretic, anti - inflammatory, antidiarrheal, hypoglycemic, hepatoprotective, antioxidant, and antimicrobial activities.Internally, A Tridax is used to treat ailments such as leucorrhea, leprosy, dysentery, colitis, constipation, and bronchial asthma. It is also a popular shown moderate activity against S almonella typhi, a strain known for its resistance to multiple drugs. Furthermore, both ethanol and aqueous extracts have shown inhibitory effects against remedy in Ayurveda, where it is used in the preparation Khadiradi Guti for treating sore throat, tonsillitis, and gum diseases. The therapeutic value of the plant extends to addressing imbalances in the body's kapha dosha, which are

believed to cause various oral and respiratory issues.Studies have shown that extracts from Acacia catechu exhibit antimicrobial activity against a wide range of pathogens. Aqueous extracts have shown moderate activity against S almonella typhi, a strain known for its resistance to multiple drugs. Furthermore, both ethanol and aqueous extracts have shown inhibitory effects against *Staphylococcus aureus* highlighting their potential as alternatives to conventional antibiotics. The aqueous extract of tridax along with smaller amounts of flavonoids, which are well - known for their antioxidant properties. These antioxidant activities are believed to contribute to its anti -inflammatory, antineoplastic, and analgesic effects

EXPERIMENTAL WORK

Method of Extraction: Maceration

i. Extraction of Tridax Procumben

Fresh and healthy stems of Tridax Procumben were collected and washed with distilled water. The stems were shade dried and powdered using grinder about 50 g of powder was mixed with 500 mL ethanol and water mixture (70:30) in a conical flask. The mixture was kept for 48–72 hours with occasional stirring for proper extraction, after extraction, the solution was filtered using muslin cloth and filter paper to remove impurities. The filtrate was heated on water bath below 50°C to obtain concentrated semisolid extract prepared extract was stored in airtight container for further use.

ii. Extraction of Jatropha curcus

Jatropha curcus powder was collected and cleaned properly. About 10 g of Jatropha curcus powder was mixed with 100 mL ethanol in a conical flask. The mixture was kept for 48 hours with occasional stirring for proper extraction after extraction, the solution was filtered using muslin cloth and filter paper to remove impurities the filtrate was heated on water bath below 50°C to obtain concentrated extract prepared extract was stored in airtight container for further use.

Phytochemical Screening of Tridax procumbens

The phytochemical screening of the plant extracts involved several qualitative tests to identify the presence of different bioactive compounds. To detect steroids, 1 ml of extract was dissolved in 10 ml of chloroform, followed by adding an equal volume of concentrated sulfuric acid along the side of the test tube. A red coloration in the upper layer and yellow with green fluorescence in the sulfuric acid layer indicated the presence of steroids. For tannins, two tests were performed:

Phytochemical Screening of Jatropha curcus

The extract was studied for its phytochemical analysis by qualitative chemical test. The presence of major phytoconstituents were present in following table. Phytochemical analysis for the prepared extracts:

Fig. Phytochemical Tests.

• Confirmatory Tests for Jatropha curcus

1. **Test for Triterpenoids:** Two ml of trichloroacetic acid was added to 1ml of extract. The presence of terpenoids was confirmed by the formation of red precipitate.
2. **Test for Tannin:** 0.5gm of plant extract and 2ml of water then heat on water bath, filter add 1ml 10% Fecl3. Formation of blue-black solution.
3. **Test for Flavonoids:** 5ml distilled water + 0.2 gm extract mixed add 1ml of 1% Alcl3. Formation of light yellow ppt
4. **Test for Amino Acid:** 0.2 gm extract + 5ml distilled water mixed left for 3 hr then filter, 2ml filtrate + 0.1ml million reagent. Formation of yellow.

• Confirmatory Tests for Tridax procumbens

1. **Test for Alkaloids:** 3ml conc. Extract + 1ml HCL heat for 20 min cooled and filter. Filtrate treated with wagoner reagent. Formation of brown reddish ppt.
2. **Test for Phenols:** Test extract+4 drops alc. Fecl3 sol. Formation of bluish black colour.
3. **Test for Flavonoids:** Extract + 10% NaOH. Formation of intense yellow colour.

SR NO.	Phytoconstituent	Test	Tridax Procumben	Jatropha curcus
1	Alkaloids	Mayer Test	+	+
2	Carbohydrate	Molisch Test	+	+
3	Phenolics	Ferric Chloride Test	+	+
4	Flavonoids	Shinoda Test	+	+
5	Saponins	Foam Test	+	-
6	Glycosides	Keller Killiani Test	+	+

Formulation of Cream

Preparation of o/w emulsion cream- In a single beaker, the emulsifier and the oil-soluble ingredients are melted in a water bath at 75°C. Preservatives and water-soluble ingredients are also taken and melted at 75°C in a different beaker of water. Following heating, the water phase was gradually added to the oil phase in a mortar and pestle, and the mixture was triturated until a clicking sound was produced. Finally, preservatives and/or fragrances are applied when the temperature drops. There will be more water in this preparation than oil.

Table 1: Formulation of cream.

Sr. no	Ingredient	Batch-1	Batch-2	Batch-3
1	Tridax Procumben Extract	0.2 ml	0.5 ml	1 ml
2	Jatropha curcus Extract	0.2 ml	0.5 ml	1 ml
3	Bees wax	1.6 g	1.6 g	1.6 g
4	Liquid paraffin	5.0 ml	5.0 ml	5.0 ml
5	Borax	0.2 g	0.2 g	0.2 g
6	Methyl Paraben	0.01 g	0.01 g	0.01 g
7	Menthol oil	0.1 ml	0.1 ml	0.1 ml
8	Rose water	q.s to 20 g	q.s to 20 g	q.s to 20 g

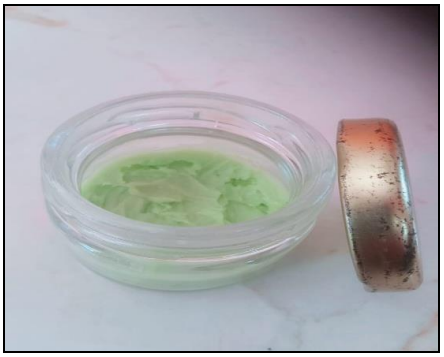

Fig. Formulated Wound Healing Cream.

Evaluation Parameters of developed Formulation

1. Physical Appearance: The Physical appearance of the cream can be observed by its dye, harshness and graded it is observed Clear.

- ✓ Colour: light green
- ✓ Odour: Characteristics

2. pH: The pH is cheaking by using pH meter & observed (5.7)

3. Spreadability: Acceptable quantity of sample is taken between two glass slides and a load of 100gm is applied on the slides for 5 twinkles. Spreadability can be expressed as S= m*l/t Where, m= weight applied to upper slide = 100 l= length moved on the glass slide = 4.5

T = time taken = 5 sec 100*4.5 = 90 5

4. Homogenesity: The formulation was tried for the uniformity by visual appearance and by touch.

5. Washability: Formulation was applied on the skin and also ease prolong of washing with water and checked.

6. Phase Sepration: Both oil & aqueous phase mixing.

7. State: Semi-Solid.

RESULTS

Phytochemical Composition of the Extracts Both Jatropha curcus and Tridax procumbens exhibited a range of bioactive compounds, such as flavonoids, tannins, alkaloids, phenols, saponins, and steroids.

Jatropha curcus demonstrated higher yields of phenolic compounds, while Tridax procumbens was richer in flavonoids and alkaloids. These findings confirm the Wound healing potential of the plant extracts. Formulation of cream The cream base was prepared according to the formula and procedure mentioned then addition of extract to the cream base antimicrobial cream is prepared as displayed in Table -1& formed cream get passed all evalution paramertes like, pH, Spredability, Washability, Homogenicity, etc.

SR.NO	Test	F1	F2	F3
1	Colour	Light green	Light green	Light green
2	Odour	Characteristics	Characteristics	Characteristics
3	Consistency	Good	Good	Good
4	pH	5.7	5.9	6.1
5	Spreadability	90 g.cm /sec	82 g.cm /sec	76 g.cm /sec
6	Homogenecity	Good	Good	Good
7	Washability	Easy to wash	Easy to wash	Easy to wash

DISCUSSION

This study aimed to formulate a topical antimicrobial cream using plant-based extracts from Tridax procumbens & Jatropha curcus, both of which are traditionally recognized for their potent antimicrobial and wound-healing properties. The selection of these two medicinal plantswas based on their well-documented antibacterial, antifungal, and anti-inflammatory activities. Phytochemical constituents present in both extracts, such as tannins, flavonoids, and other bioactive compounds, contribute to their antimicrobial potency, making them suitable candidates for the development of a natural Wound healing cream. The cream was formulated as an oil-in-water (O/W) emulsion to ensure desirable spreadability, texture, and patient acceptability. During formulation, particular attention was given to maintaining the stability and homogeneity of the cream while preserving the biological activity of the incorporated extracts. The inclusion of both Jatropha curcus and Tridax procumbens extracts was optimized to ensure synergistic Wound healinf effects. The antimicrobial activity of the individual plant extracts was evaluated using the agar well diffusion method against common bacterial strains, Escherichia coli. Jatropha curcus demonstrated a more pronounced antimicrobial effect, producing a zone of inhibition of 14 mm against E. coli. In comparison, Tridax procumbens showed slightly lower activity, with inhibition zones measuring 12 mm for E. coli. These results suggest that E. coli is generally more susceptible to the antimicrobial agents present in both plant extracts than B. subtilis. Furthermore,Jatropha curcus exhibited superior antibacterial efficacy compared to Tridax procumbens, particularly against E. coli, indicating stronger antimicrobial properties. When used in combination, the extracts produced an enhanced antimicrobial effect, suggesting a synergistic interaction between the phytoconstituents of both plants. This synergism contributed to the increased overall effectiveness of the cream formulation compared to the use of either extract alone. The observed antimicrobial activity supports the potential use of this herbal cream as an effective treatment for skin infections, due to its broad-spectrum antibacterial action and the added benefits of natural wound healing and anti-inflammatory properties. Overall, the formulation holds promise as a natural, plant-based alternative for managing superficial skin infections.

CONCLUSION

The present study successfully formulated and evaluated an Wound healing cream incorporating extracts of Tridax procumbens & Jatropha curcus. Phytochemical screening revealed the presence of different bioactive constituents such as flavonoids, tannins, alkaloids, phenols, saponins, and steroids, which are responsible for the observed Wound healing activity. Jatropha curcus showed a higher content of phenolic compounds, while Tridax procumbens was richer in flavonoids and alkaloids, confirming the therapeutic potential of both plants. The cream was prepared as an oil-in-water emulsion and exhibited favourable physicochemical characteristics, including a clear appearance, characteristic odour, smooth consistency, spreadability, homogeneity, pH of 5.7, and no phase separation. Antimicrobial testing against Escherichia coli demonstrated significant zones of inhibition, particularly with Jatropha curcus (14 mm for E. coli) and Tridax procumbens (12 mm for E. coli). The results highlight the greater sensitivity of E. coli and suggest that the combination of both plant extracts enhances the antimicrobial effect through synergistic action. The developed herbal cream provides a promising natural alternative for the management of skin infections, combining antimicrobial efficacy with beneficial wound-healing and anti-inflammatory properties.

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