



Formulation and evaluation of herbal antiseptic cream for wound healing: A research

Supriya Pawar^{1*}, Komal Sul², Dr. Rajendra Patil³, Nayan Pawar¹

¹ Student, Department of Pharmaceutics, Delonix Society's Baramati College of Pharmacy Barhanpur, Maharashtra, India

² Professor, Department of Pharmaceutics, Delonix Society's Baramati College of Pharmacy Barhanpur, Maharashtra, India

³ Principal, Department of Pharmaceutics, Delonix Society's Baramati College of Pharmacy Barhanpur, Maharashtra, India

Abstract

Wound healing is healing process after any injury. Antiseptic cream Soothes and heals wounds protect against infection and can be used to treat cuts, Non-healing or bleeding wounds. The main objective of this study is to check antibacterial potency of herbal antiseptic cream containing Galinsoga quadriradiata extract. Galinsoga quadriradiata belongs to the family Astraceae. The plant of galinsoga quadriradiata used in traditional preparations for wound healing. The healing properties of Galinsoga quadriradiata are due to presence of various chemical constituents. In the present study herbal antiseptic cream containing ethanolic leaves extract of galinsoga quadriradiata, Beeswax, coconut oil, emulsifying wax, vitamin E oil, Glycerine, neem oil, Methyl Paraben, rose water was formulated and evaluated for wound healing activity. Cream is formulated based on wound healing potential of herbal extract extracted using Soxlet apparatus with solvent ethanol. The prepared three formulations were evaluated for physical evaluation tests like color, odor, homogeneity pH, spreadability, antibacterial activity etc. Antibacterial activity was determined by agar well diffusion method against strains of Staphylococcus aureus, E. coil which are commonly responsible for topical infections. The prepared herbal antiseptic cream of galinsoga quadriradiata was found to be used topically in order to treat wound

Keywords: galinsoga quadriradiata, herbal, antiseptic, extraction, soxhlet apparatus, astraceae, wound healing, antibacterial

Introduction

Galinsoga quadriradiata is a species of flowering plant in the family Astraceae, It is also known as shaggy soldier, hairy galinsoga. This plant mainly grow in Mexico. The leaves of plant contain flavonoids (Apigenin 7-β-D-glucoside, Galinoside A, Galinoside B), Aromatic esters (Galinosoate A, B, C), Phenolic acid derivatives (Gallic acid, 3,4-dihydroxy benzoic acid, 4-Hydroxy benzoic acid), Diterpenoids, Steroids (7-hydroxy-β-sitosterol, 7-hydroxy stigmaterol), caffeic acid derivatives, uracil etc. It is having anti inflammatory, antibacterial activity. Creams are semisolid dosage form and intended for topical application to the skin. Creams are semisolid emulsion of water and oil (w/O).

Water in oil creams are also more moisturizing as they provide an oily barrier which reduces water loss from the stratum corneum the outer most layer of skin. It is also true that eight percent of world's population relies on medicinal plants for their primary healthcare. Antiseptic creams are used to protect skin from harmful agents. In market various synthetic creams containing chemicals and their derivatives prove to cause side effects, hence it is always better to use cream which contains herbal ingredients.

Thus value of herbs in pharmaceutical making has been extensively improved in person care system and there is great demand for the herbal cream. Antibacterial activity has it's own benefits to prevent bacterial growth. This formulation contains herbal extract of galinsoga quadriradiata. Many reports have shown that some galinsoga species contains antioxidant, anti-inflammatory activity

Objectives

1. The purpose of the present investigation is to formulate and evaluate a herbal antiseptic cream for wound healing.
2. Evaluation of herbal antiseptic cream such as appearance, pH, consistency, spreadability, skin irritation test and antibacterial activity.

Material and methods

Table 1

Material used	Source
1) Leaves of Galinsoga quadriradiata	Delonix society's Baramati college of pharmacy (DSBCOP) campus, Baramati
2) Coconut oil	DSBCOP, Pharmaceutics laboratory
3) Neem oil	DSBCOP, Pharmaceutics laboratory
4) Vitamin E oil	DSBCOP, Pharmaceutics laboratory
5) Emulsifying wax	DSBCOP, Pharmaceutics laboratory
6) Methyl Paraben	DSBCOP, Pharmaceutics laboratory
7) Glycerine	DSBCOP, Pharmaceutics laboratory
8) Ethanol	DSBCOP, Pharmaceutics laboratory
9) Rose water	DSBCOP, Pharmaceutics laboratory

All chemicals and solvents used were of expected standards.

Extraction of selected plant

Soxhlet extraction or hot continuous extraction

Leaves of Galinsoga quadriradiata were collected from Delonix Society's Baramati College of Pharmacy Barhanpur, campus and washed thoroughly with distilled water and shade dried for 3 days.

Dried leaves were ground into powder form. This finely ground sample (30 gm) was placed in a porous bag or thimble made from filter paper. Extraction solvent i.e Ethanol was heated in bottom flask, vaporizes into sample

thimble, condenses in condenser and drip back when the liquid content reaches the siphon arm, the liquid content



Fig 1: Soxhlet extraction

transfer into the bottom flask again and the final ethanolic extract is collected and evaporate the excess ethanol to get concentrated extract.



Fig 2: Extract of *G. quadriradiata*

Preparation of herbal antiseptic cream

Heat coconut oil, Beeswax, emulsifying wax, neem oil in a borosilicate glass beaker at 75°C and maintain that heating temperature (Oil phase). In another beaker dissolve Methyl Paraben in distilled water add Glycerine and heat this beaker to 75°C to dissolve Methyl Paraben and get a clear solution (Aqueous phase). Then slowly add this Aqueous phase to heated oily phase in mortar pestle (w/o emulsion) and mix properly. Then add ethanolic extract of galinsoga quadriradiata, vitamin E oil, rose water and stir vigorously until it forms a smooth cream and mix the cream in geometric manner, and mix all the ingredients properly.

Formulation table

Table 2

Ingredients	Formulation F1	Formulation F2	Formulation F3
1) Beeswax	3 gm	3.5 gm	3 gm
2) Emulsifying wax	2.5 gm	2.5 gm	3 gm
3) Coconut oil	3 ml	3.5 ml	3.5 ml
4) Neem oil	2 ml	2 ml	1.5 ml
5) Vitamin- E oil	1 ml	1 ml	1 ml
6) Extract	4 ml	3 ml	3.5 ml
7) Methyl Paraben	0.04 gm	0.02 gm	0.06 gm
8) Distilled water	4 ml	4 ml	3.5 ml
9) Glycerine	Q. s	Q. s	Q. s
10) Rose water	Q. s	Q. s	Q. s

Pharmaceutical evaluation of cream

1. Physical evaluation

In this test the cream was observed for color, odour, texture, state.

Appearance: Semisolid in nature.

Odour: Characteristic

Color: Faint Green.

Transparency: Non- transparent.

Consistency: Smooth.



Fig 3: Herbal antiseptic cream

2. pH

The pH of formulated cream were determined by using digital pH meter by dissolving 1 gm cream in 100 ml of water. The pH of the cream were also determine by dissolving the pH paper in to the above solution of cream.

3. Consistency

The consistency of formulated creams were determined by hands. Take pinch of a cream and rubbed it with fingers.

4. Spread ability

The spread ability of the formulated cream were determined by 500mg of the cream was sandwiched between 2 Slides. A weight of 100gm was placed on upper slide. The weight was removed and extra formulation was scrapped off. The lower slide was Fixed on board of apparatus and upper slide was fixed with non-flexible string on which 20g load was applied. Time taken by upper slide to Slip off was noted down.

5. Antibacterial activity

When the wound has been occurred then there may be chances for bacterial or microbial infection from environment and galinsoga quadriradiata and neem act as antimicrobial and anti-inflammatory activity.

Medium

5.6g of Nutrient Agar is added to 200 ml distilled water and autoclaved at 121°C for 15 minutes at 15 lbs. and poured in sterile Petri plates up to a uniform thickness of approximately 4mm and the agar is allowed to set at ambient temperature and used.

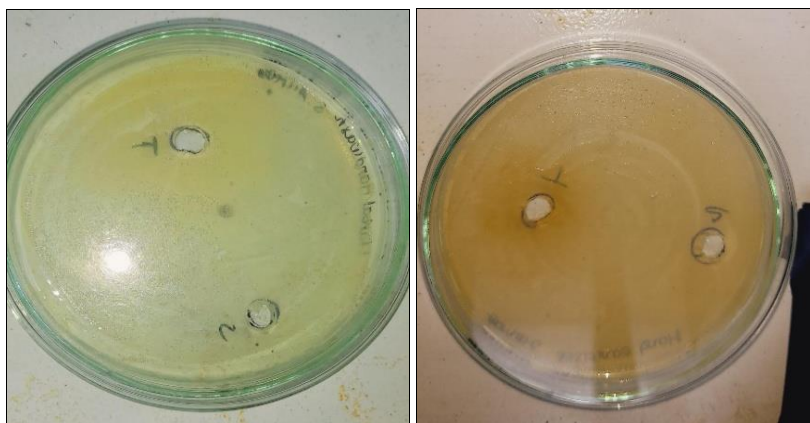


Fig 4: Antimicrobial activity of herbal antiseptic cream

6. Skin irritation test

In this test 0.5 gm of cream is applied to the area of approximately 6×2 cm and then this area checked for irritant, erythema, edema for an interval of 24 hrs and reported.

7. Wash ability

A small amount of cream was applied on the hand and it is washed with tap water.

8. Phase separation

Prepared cream was kept in a closed container at a room temperature away from light and phase separation was checked for 24 hrs for 3 days.

9. Greasiness

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or greasy.

10. Compatibility study

From the formulation table we can say that all the herbal ingredients like galinsoga quadriradiata, Beeswax, emulsifying wax, neem oil, vitamin E oil, Methyl Paraben, rose water, Glycerine are compatible with each other and support the activity of galinsoga quadriradiata.

Result

- This cream could become a media to use these medicinal properties effectively and easily as simple dosage form
- Natural Remedies are more acceptable as they are safer with fewer side effects than synthetic once, so a herbal wound healing formulation is nontoxic, safe, effective

Procedure

In this method the agar is melted, cooled at 45° C, inoculate with the test microorganism and then pour in the sterile Petri plate. In this method when the agar plate has been solidified then made the partition of plate using marker one part is for standard and other for formulation, then evenly spread the suspension containing bacterial strains on plate then make the holes with sterile cork borer and add the formulation in hole then make another hole and add the marketed formulation which act as standard and incubate the plates for 24 hrs. After incubation diameter of zone of inhibition is measured, which indicates the relative activity of different antibacterial substances against the tested microorganisms.

and improve patient compliance as it contain herbal ingredient. From the ancient time.

- These prepared herbal wound healing cream was evaluated for various parameters like appearance, determination of consistency, Spreadability, Skin irritation test and antimicrobial activity against, E.coli, streptococcus aureus.

Table 3

Evaluation Parameters	Observations
Appearance	Colour: Faint green Odour: Characteristic State: Semisolid Transparency: Non transparent
pH	6.8
Consistency	Smooth
Skin irritation test	No irritation
Spreadability	Easily spreadable
Phase separation	No phase separation
Greasiness	greasy

Antimicrobial activity

Table 4

Bacterial strains	Zone of inhibition
E. coli	15mm
Staphylococcus aureus	17mm

Conclusion

- The main aim of formulated herbal antiseptic cream was to cure or treat the injury.
- The prepared herbal antiseptic cream was evaluated using various parameter and was found to be satisfied

for the application to the skin where the injury has been occurs.

- The cream which are prepared from natural sources they shows fewer side effect as compare to cream which are prepared from synthetic medicines.
- The natural remedies are more acceptable and which have growing demand in the market due to his lesser adverse effect, the herbal plant are more stable, efficacious and stable than synthetic formulations.
- The cream are non-irritant to the skin does not show any toxic and hypersensitive reaction.
- Formulated galinsoga quadriradiata cream was homogeneous appearance, pleasant smell and good pH. The prepared cream was found to be natural and could be used topically for wound healing and treating bleeding wounds.

Abbreviations used

Q.S – Quantity sufficient

G. quadriradiata- Galinsoga quadriradiata

DSBCOP – Delonix Society's Baramati College of Pharmacy

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