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Formulation and Evaluation Poly Herbal Cream To Treat Skin Burning

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Abstract; This study focuses on the formulation and evaluation of a polyherbal cream intended for the treatment of minor skin burns, incorporating natural ingredients such as Delonix regia extract, turmeric (Curcuma longa), peppermint oil, lavender oil, and honey. Each component was selected based on its well-documented medicinal properties: Delonix regia for its anti-inflammatory and antioxidant activities; turmeric for its curcumin content, known for wound healing and antimicrobial effects; peppermint oil for its soothing, cooling action; lavender oil for its analgesic and skin regenerative capabilities; and honey for its antibacterial and moisturizing benefits. The ingredients were homogenously mixed into a cream base and subjected to physicochemical evaluation, including pH, viscosity, spreadability, and stability testing.
The formulated polyherbal cream was then evaluated for its efficacy on minor thermal burns using in vitro and ex vivo models. Results demonstrated that the cream exhibited significant wound healing properties, reduced inflammation, and improved epithelial regeneration compared to the control. The presence of both essential oils and botanical extracts contributed synergistically to the therapeutic action, making the polyherbal formulation a promising, natural alternative for managing mild to moderate burn injuries. Further clinical testing is suggested to validate its safety and efficacy in human subjects.
Keyword ; burn , healing ,antioxidants, wound healing.

I. INTRODUCTION

Skin burns are among the most common injuries affecting individuals worldwide, resulting from exposure to heat, chemicals, electricity, radiation, or friction. Depending on the depth and severity, burns are typically classified into first, second, and third degrees. First-degree burns affect only the outermost layer of the skin (epidermis), causing redness, mild swelling, and pain. Second-degree burns extend into the dermis, leading to blistering, increased pain, and potential scarring. Third-degree burns are the most severe, damaging all layers of the skin and potentially underlying tissues, often requiring surgical intervention. Immediate and effective management of minor burns is essential to prevent infection, reduce pain, and accelerate the healing process.

The skin, being the largest organ of the body, acts as the first line of defense against environmental threats. When compromised by burns, this barrier is weakened, making the body more susceptible to microbial infections and fluid loss. Traditional treatment approaches for burns include the use of synthetic creams and ointments such as silver sulfadiazine. However, these treatments may have adverse effects, including delayed wound healing and antimicrobial resistance. As a result, there is a growing interest in natural and herbal alternatives that offer effective burn healing with fewer side effects.

Herbal medicine has been used for centuries in various cultures to treat skin injuries and enhance wound healing. Plants are rich sources of bioactive compounds with anti-inflammatory, antimicrobial, antioxidant, and wound-healing properties. The integration of medicinal plant extracts and essential oils into topical .

formulations offers a promising strategy for burn management. Combining multiple herbal ingredients in a polyherbal formulation may provide a synergistic effect, enhancing therapeutic outcomes compared to single-ingredient treatments.

This study aims to explore a polyherbal cream formulated with *Delonix regia*, turmeric (*Curcuma longa*), peppermint oil, lavender oil, and honey, each known for its dermatological benefits. The formulation intends to utilize the natural properties of these ingredients to soothe pain, reduce inflammation, promote tissue regeneration, and protect the wound from infection, offering a holistic and effective approach for treating minor skin burns.

A. Drug profile ;

Name of drug	Botanical classification	Active chemical constituents	Uses
Delonix	Synonym:*Poinciana regia* Bojer ex	Flavonoids	anti-

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regia	Hook.Biological Source:Delonix regia is a flowering plant derived from the dried or fresh leaves, flowers, and sometimes bark of the Delonix regia tree.Family;Fabaceae (Leguminosae), subfamily CaesalpinioideaeGenus:*Delonix*Species:*Delonix regia* (Bojer ex Hook.) Raf.		inflammatory, antioxidant, and wound-healing properties,
Peppermint oil		Menthol, menthone, isomenthone,mentyl acetate , champhor,limonene	Pin relif , skinn irritation.
Lavender oil		Linalool, linalyl acetate , terpinen-4-ol,and 1,8 cineole.	Soothing irrition reducing, inflammation ad promoting wound healing
Turmeric	Synonyms:Peppermint essential oil,Oil of peppermint,Mentha .Biological Source; Peppermint oil is derived from the leaves and flowering tops of the peppermint plant Family:Lamiaceae (also known as the Mint family Genus:Mentha , Species:Mentha , piperita (Hybrid species of Mentha aquatica and Mentha spicata)	Curcumin,demethoxycurcumin bisdemethoxycurcumin, zingiberene , β-Turmerone,	Reduce redness, soothe irritated skin.
Honey	Synonyms:Natural honey,Bee honey,Apis honey,Madhu (in Ayurveda),Biological Source .Honey is a natural sweet substance produced by honey bees (primarily Apis species) from the nectar of flowers, which they collect, transform, and store in honeycombs. Family; Apidae , Genus:Apis Species;Apis mellifera (Western or European honey bee)	Sugar,water,mierals, vitamin, amino acids.	acne, wound healing .

B. Formulation of cream;

Sr.no	Drug	F1	F2	Properties
1	Deloix regia	1ml	1.5ml	Atiacterial, ati inflammatory .
2	Peppermint oil	1ml	2ml	Pain relief.
3	Lavender oil	1ml	0.5ml	Soothing irritation
4	Curcuma longa	1gm	0.5gm	Reduse red ness
5	Honey	1ml	1ml	Promote wound healing .

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6	Bees wax	3.2gm	3.2ml	Skin Healing,**Thickening Agent**
7	Borax	0.16gm	0.16ml	**Emulsifying Agent**
8	Methyl paraben	0.02ml	0.2ml	Preservative
9	Water	6ml	6ml	-
10	Perfume	q.s	q.s	-

II. METHODOLOGY

1) Step 1;preparation of plat material.

- Collect fresh flowers
- Wash thoroughly to remove dirt
- Dry in shade [not direct sunlight] for 7-10 days .
- Convert into fine powder using a grinder.
- Store in airtight container.

2) Step 2 ; selection and preparation of solvent

- Choose an appprooriate solvent ; methanol or ethanol
- Use a solvent volume typically 10 times the weight of the plant material . [1;10 w\v]

3) Step 3 ; maceration

- Place the powdered material ito a clea glass container.
- Add the solvent
- Cover the container tightly.
- Allow the mixture to stand for 48-72 hr at room temperature.
- Shake or stir the mixture 2-3 times a day to improve extraction efficiency.

4) Step 4 ; filteration

- After the maceration period, filter the extract using filter paper.
- Squeeze out any remaining liquid from the plant residue .

5) Step 5 ;storage

- Cream can be packaged in variety of ways including plastic container, glass container, tubes,also in various types of pouches.

III. PROCEDURE

1) Add the required quantity of borax in beaker.
2) And sufficient amount of water.
3) Prepare a solution by heating on water bath.
4) In the above solution add required quantity of delonix regia flower extract.
5) And add them turmeric and honey in required quantity.[solution1]
6) Stir gently to ensure uniform mixing.
7) Weigh accurately peperment oil an lavender oil and add into bees wax contained in china dish.[solution 2].
8) Melt the prepare a proper solution.
9) Add solution 1 dropwise into solution 2. When both the phase get mixted properly.
10) Add preservatives in methyl paraben.

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11) The formulated polyherbal cream was kept aside for about an hr incool and dry place indirect to sunlight till it sets completely and was used after 48 hours afeter keeping at room temperature.

A. Chemical test;

Sr . no	Test	Test for	Result	Observation
1.	Shinda test	Flavonoids	Positive	Pink or red colour
2.	Mayer's test	Alkaloids	Positive	Creamy white precipitate
3.	Ferric chloride test	Tannins	Positive	Blue black or green colour
4.	Foam test	Saponins	Positive	Persistent froth foam
5.	Biuret test	Protins	Negative	Purple ,violet colour
6.	Keller killiani test	Glycosides	Positive	Brownring
7.	Salkowaski test	Terpenoids , steroid	Positive	Reddish brown colour

B. Evalution test cream;

1) Physical appearance

The physical appearance of the formulation was checked visually.
Colour ; the color of the formuation was checked out against white and black backgrounds.
Odour ; the odour of cream was checked by mixting a little amount of cream in wate and by taking smell .
Consistency ; the consistency was checked by the application on to the skin .
State ; the state of cream was examined visually.

2) determination of PH ;

The PH values of 1 % aqueous solution of the optimized cream was measure by PH meter .

3) Spreadability ;

The spreadability of formulated cream was measured by placing sample in between two slides then compressed to uniform thickness by placing a definite weight for a definite time. The specified time required to seprate the two slides was measured as spreadability .

4) Irritancy test ;

Mark an area [1 sq.cm] on the hand dorsal surface . the cream was applied to te specifie area and time was note . irritancy , erythema, oedema , was checked if any for regular intervsls up to 24 hrs and reported .

5) Washability ;

The washabiliy of cream is examined by washing heapplied part with tap water.

6) Phase separation ;

Visual observation turbiity or cloudiness in the cream solution can be a sign of phase sepration checked at room temperature.

Properties	Observation
Colour	Light yellow

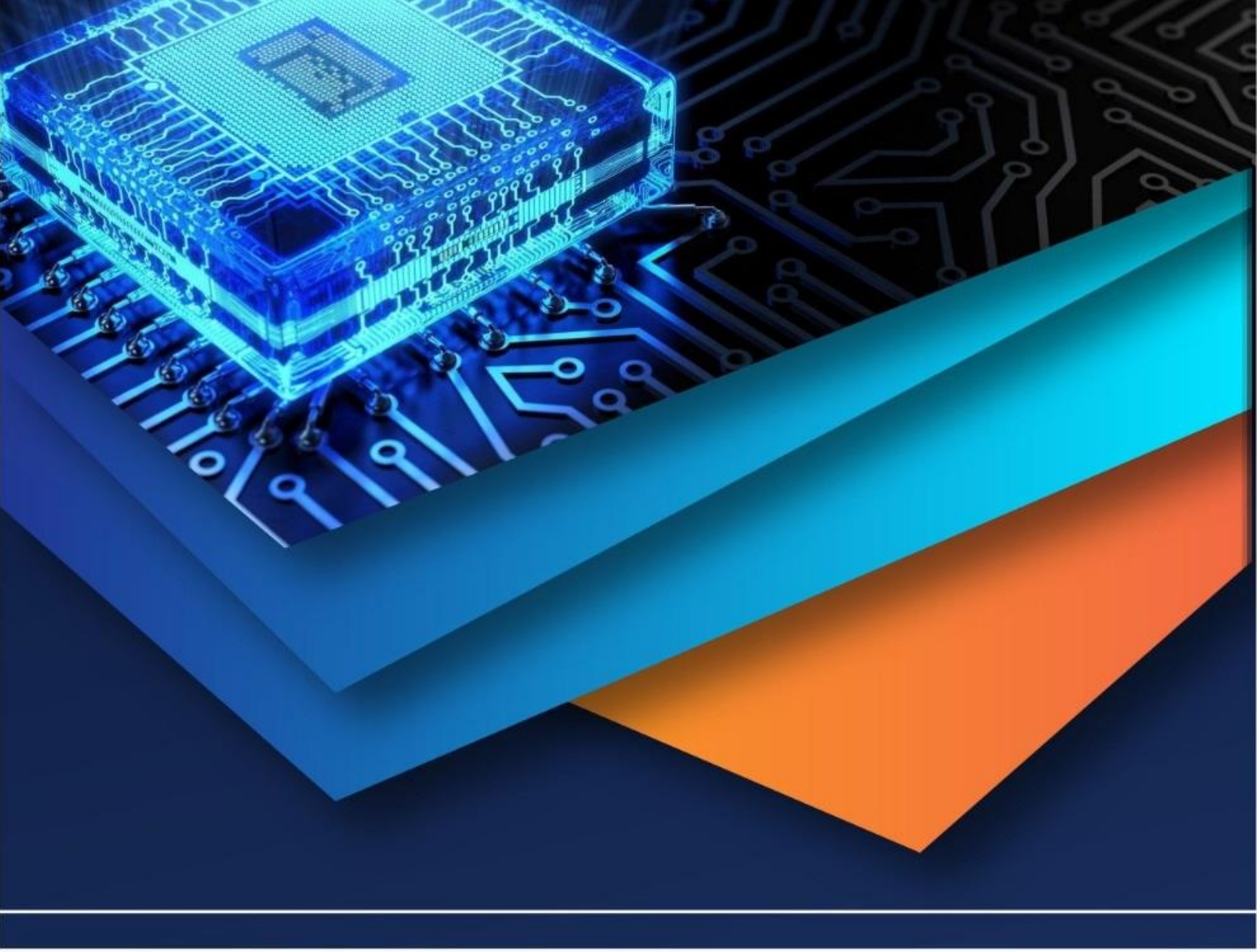
Odour	Unpleasant
state	Semisolid
texture	Smooth
PH	
Homogenicity	Homogenus
Appearance	No change in appearance
Removability	Easy removable
Irritancy test	Non irritant
Phase sepration	No seen

IV. CONCLUSION

The present study focused on the formulation and evaluation of a poly herbal cream incorporating delonix regia , tumaric, honey,lavender oil,and peppermint oil for the treatment of skin burns. Each ingredient was selected based on its known pharmacological properties; delonix regia for its anti inflammatory an wound healing potential, tumaric for its antioxidant and antimicrobial effects , honey for its natural soothing and tissue regenerating action, and the essential oils for their analgesic, cooling and antiseptic effects. The synergistic combination og these ingredients aimed to accelerate the healing process, reduce inflammation, and protect the damaged skin infection.

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