

Heelhari: A Research on Upavisha Plant for Healing Cracks

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Abstract: *The traditional medicinal plant Heelhari, popularly known as Upavisha, is well-known for its capacity to heal wounds and restore skin. Detoxification through Shodhana is necessary in order to lower toxicity and guarantee safe therapeutic use, despite the fact that every component of the plant is poisonous, with the seeds being especially dangerous due to their potent irritant effects. Its phytochemical makeup, pharmacological effects, and therapeutic uses are discussed in detail in this review. The bioactive substances have antioxidant, anti-inflammatory, and tissue-regenerative properties, which are important for the quicker repair of skin cracks and injuries. Its promise in dermatology applications has been emphasized by numerous researches on preparation techniques and contemporary pharmaceutical formulations. The results highlight the usefulness of Heelhari-based therapies in fostering skin regeneration and efficient woundcare.*

Keywords: Heel Hari, Upavisha, Skin Cracks, Herbal Preparation, Wound Healing etc

I. INTRODUCTION

The herbal remedies are safer, more effective, and have less side effects than synthetic pharmaceuticals, they have become increasingly important worldwide. Due to their affordability, accessibility, and cultural acceptability, they are very beneficial to healthcare systems in both urban and rural areas. Due to its diverse therapeutic uses, Heelhari, also known as Upavisha i.e. holds a prominent place among the many medicinal plants used in traditional healing practices [1]. This plant is often mentioned in Ayurveda, Siddha, and Unani medical practices for the treatment of skin conditions. Illnesses, injuries, ulcers, infections, and inflammatory disorders. The nut, bark, and oil are traditionally utilized after detoxification because they are naturally high in bioactive chemicals. Compounds like triterpenoids, flavonoids, and phenolics. The fact that it acts as a wound-healing and skin-restoring ingredient is supported by a solid scientific basis from these components. The use of this plant in the development of herbal gels, lotions, and creams for the treatment of chapped skin and chronic wounds has become increasingly popular in recent years as a result of the rising demand for safe natural medicines [2].

The importance of fractures:

A widespread dermatological ailment that affects people of all ages is cracked skin, particularly on the heels. Dryness, roughness, and fissures are its defining characteristics, and these can develop into severe, painful cracks. These cracks not only cause discomfort but can also bleed, increasing the risk of secondary bacterial or fungal infections. Cracked heels can seriously limit mobility and harm one's quality of life in extreme situations. Factors like inadequate hydration, prolonged standing, obesity, bad foot hygiene, diabetes, or constant exposure to dry and dusty conditions can frequently worsen the condition. Hydration, miniaturization, exfoliation, and wound protection are the usual steps in treating cracked heels. Although modern synthetic creams may provide momentary relief, they are often constrained by their adverse effects, high price, or inability to regenerate. Therefore, there is an obvious need for herbal substitutes that not only treat symptoms but also promote long-term skin regeneration and healing [3] [4] [5].



Cautions:

- Irritant Properties: The kernel and seed oil contain phenolic compounds like bhilawanols. When used straight without purification, these substances can result in blisters, skin irritation, and contact dermatitis.
- Toxicity Risk: If raw seeds are consumed without proper detoxification, they are toxic and can induce severe inflammation in the mouth, throat, and gastrointestinal tract.
- Allergic Responses: Those who are hyperresponsive may have a rash, itch, or trouble breathing.
- Dose-Dependent Effects: Only particular dosages have a safe therapeutic impact; higher dosages might cause systemic toxicity, diarrhea, nausea, and vomiting.
- Contraindications: Avoid in Breastfeeding and pregnant women (risk of toxicity to the fetus/infant). Patients who are elderly or children (because of their vulnerability).
- Need for Purification: Shodhana (purification using cow's milk, butter, or other media) is recommended by traditional Ayurvedic practice before any therapeutic applications.

Phytochemical constituents:

Different active ingredients in the plant contribute to its pharmacological effects:

- Flavonoids: Quercetin, kaempferol (an antioxidant)
- Phenolic substances - Anacardic acid (antimicrobial, anti-inflammatory)
- Biflavonoids: Semecarpetin, semecarpol (wound healing)
- Oils and Fats - Nut oil with medicinal effects [8]

Pharmacological activity:

Possible Wound Healing :

Accelerates the processes of wound contraction and epithelialization. Promotes the formation of collagen and granulation tissue, both of which are vital for healing wounds and skin cracks.

Anti-Inflammatory Effect:

Reduces redness, pain, and edema in injured or damaged skin. Reduces inflammatory mediators, resulting in a calming effect in the affected area.

Antioxidant Property:

Neutralizing free radicals in injured tissues, it prevents oxidative stress, which would otherwise impede wound healing

Antimicrobial Activity:

Active chemicals help prevent the proliferation of skin pathogens such as Staphylococcus aureus and Pseudomonas aeruginosa. They also protect wounds, cuts, and cracked heels from becoming infected.

Impact on Collagen Production :

Increases the hydroxyl proline level, which indicates an improvement in collagen synthesis. Strengthens the mended skin and lowers the chance of re-cracking.

The Function of Hydration and Emollient:

When mixed with a cream base, the extract hydrates and softens the skin. It helps restore suppleness and smoothness to the chapped areas [14][15][7].

Upavisha: (semi-toxic drug) in Ayurvedic medicine. These substances have therapeutic value but may cause harmful effects when used in unprocessed form or excessive quantity. Hence, purification procedures known as Shodhana are carried out before medicinal use. Raw Semecarpus anacardium may produce irritation, itching, or blisters on the skin. After purification, it is commonly utilized in Ayurvedic preparations for wound healing, inflammation, and various skin disorders.



NEED AND OBJECTIVE

Need:

- Common problems include skin fissures and lesions, especially among those exposed to continuous friction, chemical compounds, or dry conditions.
- A lot of the synthetic creams and ointments available cause negative reactions such as allergies, irritation, and resistance. The need for inexpensive, safe, and organic wound healing methods is growing.
- The application of this plant in wound treatment and skincare products is supported by both conventional data and a number of pharmacological actions.
- As a result, it is both essential and highly relevant to study and create an herbal remedy based on this plant.

Objectives:

- To study the plant's phytochemical, botanical profile.
- To highlight its traditional and therapeutic applications in the treatment of cracks and wounds.
- To investigate the potential of utilizing this plant to make topical herbal products (cream).
- The evaluate criteria used to assess the stability and efficacy of these substances.
- To establish itself as a natural alternative to man-made wound treatment products.

PLAN OF WORK

- Selection of review topic
- Literature survey
- Selection of ingredients and Excipient
- Compatibility of ingredients
- Formulation
- Evaluation
- Conclusion and Reference

II. LITERATURE REVIEW

Semalty M.et al(2010).

"Traditional schools of medicine have used this plant for many diseases since ancient times. Its nuts include a number of biologically active chemicals including as biflavonoids, phenolic compounds, bhitawanols, minerals, vitamins, and amino acids, which demonstrate diverse therapeutic effects. The fruit and nut extracts demonstrate actions such as anti-atherogenic, anti-inflammatory, antioxidant, anti-cracking, antimicrobial, anti-reproductive, CNS-stimulating, hypoglycemic, anticancer, and hair growth-promoting properties. The several pharmacological activities of the plant"[2].

Upreti S.et al,(2016).

"Traditional herbal medicines have played a central role in healthcare systems across the world, particularly in regions where Ayurvedic and Siddha practices are deeply established. This medicinal plant has been described in classical texts as a potent therapeutic source with diverse pharmacological activities, and it is historically referred to as a "half physician" due to its broad medicinal potential. Early ethnobotanical reports highlight its extensive use in managing inflammatory conditions, skin disorders, microbial infections, and metabolic disturbances. Various formulations prepared from its nut, oil, and extracts are documented in ancient Ayurvedic literature for the treatment of ailments such as joint pain, respiratory disorders, reproductive issues, and various dermatological problems"[6].

• Gaikwad S. S., et al,(2025).

Cracked heels, or heel fissures, commonly arise due to excessive dryness, thickening of the outer skin layer, and reduced skin elasticity. These conditions often lead to pain, irritation, and an increased risk of bacterial infections.



Although traditional remedies may provide temporary comfort, they can sometimes cause adverse reactions or fail to deliver long-term benefits.

Herbal formulations offer a natural, economical, and eco-friendly alternative because they contain bioactive components with antibacterial, anti-inflammatory, moisturizing, and healing properties. This research aims to develop and evaluate an herbal ointment specifically designed to treat dry and damaged heels, with the goal of improving hydration, enhancing skin repair, and promoting overall foot health"[5].

Deepa N.et al ,(2024)

The review highlights the use of Shodhana as a purification method to minimize the irritant nature of the nut extract. It summarizes recent research on its chemical profile, traditional applications, pharmacological actions, and safety considerations. Possible uses in pharmaceutical, cosmetic, and food-related formulations are also discussed, along with important directions for future scientific exploration"[7].

• Mortate P.R.et al,(2014)

The present study aimed to develop a herbal foot crack cream as a safer alternative to commercially available chemical-based formulations. The cream was formulated using aqueous extract of *Ficus glomerata*, along with aloe vera and curcumin. Five formulations containing different concentrations of *Ficus glomerata* extract were prepared and evaluated for various parameters including FTIR analysis, pH, spreadability, washability, viscosity, irritancy, microbial growth, crack healing activity, in-vitro permeation, and stability studies. FTIR analysis indicated the absence of any chemical incompatibility among the ingredients. All formulations showed acceptable pH, good spreadability, satisfactory washability, and suitable viscosity. The optimized formulation (F5) demonstrated significant crack healing activity with noticeable reduction in foot cracks compared to the initial condition. In-vitro permeation studies revealed that drug permeation increased with higher concentrations of *Ficus glomerata* extract. The optimized cream formulation remained stable throughout the three-month accelerated stability study[17].

Feasibility of Equipment

| Sr. No. | EQUIPMENT NAME | LOCATION |
|---------|--------------------------------------|-----------------------------------|
| 1 | pH paper | Vidya Niketan Collage of Pharmacy |
| 2 | Weighing balance(digital,electronic) | Vidya Niketan Collage of Pharmacy |
| 3 | Heating mantle | Vidya Niketan Collage of Pharmacy |
| 4 | Thermometer | Vidya Niketan Collage of Pharmacy |
| 5 | Magnetic stirrer | Vidya Niketan Collage of Pharmacy |

Formulation:

| SR.NO | INGREDIENT | QUANTITY | USES |
|-------|------------------------------|-----------|---|
| 1 | Semecarpus anacardium Powder | 200mg | Help in healing cracked heels and dry skin. |
| 2 | Aloevera | 4.5gm | Humectant, Soothing base |
| 3 | Rose water | 2ml | Cooling effect |
| 4 | Tulsi | 1-2 drops | Natural preservative |
| 5 | Bees wax | 1gm | Emulsifier |
| 6 | Coconut oil | 2ml | Moisturizer |

III. MATERIAL AND METHOD

Material:

• Semecarpus Anacardium Powder:

Preparation of Semecarpus anacardium Powder:

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The outer shell of *Semecarpus anacardium* should be carefully removed, as it contains toxic substances. While handling the drug, it is essential to wear double gloves and a mask due to its irritant and toxic nature. The small, white-colored kernels are then collected. These are subjected to detoxification by boiling in milk for about 2–3 hours, which helps in reducing toxicity. After boiling, the material is filtered and washed with a small quantity of water. It is then dried properly to remove all moisture content. Once completely dried, the material is ground into a fine powder. The powder is then passed through sieve number 5 to obtain a uniform particle size. It is obtained from market.



• **Aloevera:**

The Cracked heels become calms, hydrates, and promotes skin healing. The water content of aloe vera gel is close to 99%, which aids in hydrating and softening the dry, harsh skin on the heels. Additionally, it keeps the skin pliable and prevents it from breaking [9]. It obtained from the environment of Lakhewadi and pulp got from VNCOP laboratory.



• **Rosewater:**

Rose water gives the skin a little moisture and helps maintain its natural equilibrium. It lessens the likelihood that hard, coarse heel skin will break out again. Rose petals' unique chemicals, such as flavonoids, aid with redness, irritation, and edema. Because of this, rose water is beneficial for chapped, irritated, and painful heels. Additionally, rose water



possesses certain antibacterial and antifungal properties that may help prevent infections in broken heels [9]. It obtained from the VNCOP Pharmacognosy laboratory, Lakhewadi.



• **Bees wax :**

The skin is protected by a coating of beeswax that prevents moisture loss. This layer of defense aids in retaining moisture and prevents heels from becoming dry again. By attracting water to it, it softens tough and hard skin and acts as a humectant and emollient. Regular use helps stop heel fractures from recurring. Beeswax promotes collagen synthesis and skin cell regeneration, which aids in the healing of minor cuts and heel fissures. It contains vitamin A, fatty acids, esters, propolis, and other natural compounds with antibacterial, antifungal, and anti-inflammatory effects. These characteristics aid in minimizing irritation and preventing infections in split heels [10]. It obtained from the VNCOP Pharmaceutics laboratory, Lakhewadi.



• **Tulsi :**

Tulsi act as a natural preservative because its antimicrobial and antioxidant properties inhibit the growth of microorganisms and help increase the product's shelf life. It is obtained from VNCOP herbal garden.





• **Coconut oil:**

Coconut oil is incorporated into crack creams as a natural emollient and healing agent because of its hydrating, antimicrobial, and skin-repairing properties. obtained from the market.



METHOD

I. Step 1: Purification

Unless pre purified:

Take the shell off after lightly roasting the seeds.

Cook kernel in cow's milk for course of 3 – 6 hours

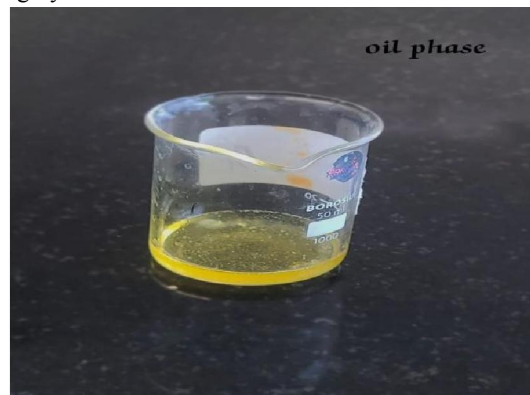
Dry and ground into powder (fine mesh)





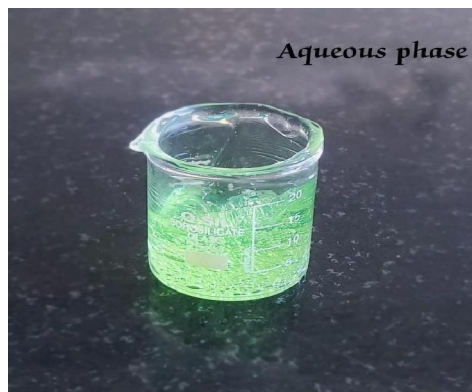
II. Step 2: Oil Phase

In a beaker, melt coconut oil and beeswax at a temperature of 60 - 70° C.
Mix in the powder and mix thoroughly.



III. Step 3: Aqueous Phase

Rose water and aloe vera gel that is only somewhat warm.
Dissolve thoroughly after adding preservatives.

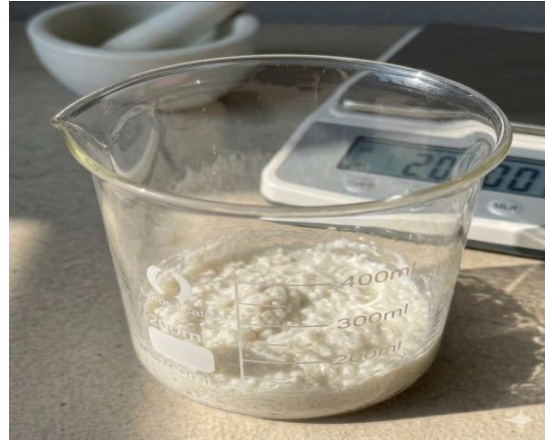


IV. Step 4: Emulsification

With continuous mixing, gradually introduce the aqueous phase into the oil phase.

Use a homogenizer or mixer to stir until the mixture is smooth.

Allow it to cool at room temperature.

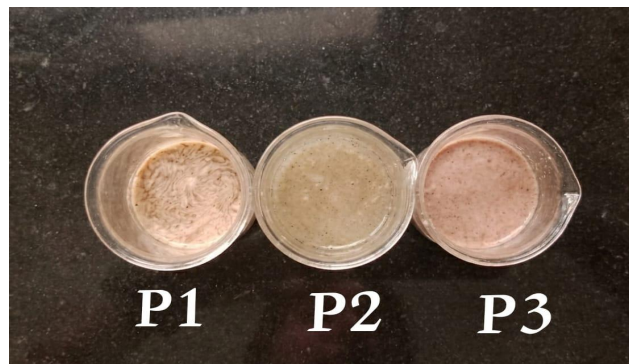


V. Step 5: Packaging

- Primary Packaging, Secondary Packaging
- Store in a cool and dry place
- Protect from direct sunlight and moisture
- Keep container tightly closed after use

PRELIMINARY STUDY

| SR.NO. | INGREDIENT | P1 | P2 | P3 |
|--------|------------------------------|-------|-------|-------|
| 1 | Semecarpus Anacardium Powder | 150mg | 200mg | 250mg |
| 2 | Aloe vera | 4.5gm | 4.5gm | 4.5gm |
| 3 | Rose water | 2ml | 2ml | 2ml |
| 4 | Tulsi | q.s. | q.s. | q.s. |
| 5 | Bees wax | 1gm | 1gm | 1gm |
| 6 | Coconut oil | 2ml | 2ml | 2ml |



Experimental Work-

From the preliminary batches we got some conclusion which consist, differential results come out. Batch P2 has kind of good outcome as compare to others. The concluded evidence is as follows:

- Colour- whitish brown
- pH-5.5 of P2 batch
- Moisture content -0.18%

EVALUATION PARAMETERS

- Phase separation
- Physicochemical Properties
- Sensory evaluation
- Colour
- Moisturizing property

• Phase separation

Phase separation is a significant evaluation test carried out for creams and emulsion-based formulations to assess their physical stability. During this study, the formulation is monitored under various storage conditions to determine whether the oil and aqueous phases remain uniformly mixed. A stable cream should maintain its smooth and homogeneous appearance without showing signs such as cracking, bleeding, or separation of phases. The prepared herbal crack heel cream did not exhibit any evidence of phase separation throughout the study period. The formulation remained uniform and stable, demonstrating satisfactory emulsifying capacity and good physical stability[17].

• Physicochemical Properties

The appearance of a cream is evaluated by observing its color, texture, consistency, and uniformity. An ideal cream formulation should possess a smooth and homogeneous texture without the presence of lumps, grittiness, or phase separation. The prepared herbal crack heel cream exhibited a uniform semisolid consistency with smooth texture and acceptable appearance, indicating good formulation characteristics. The pH of topical formulations plays an important role in maintaining skin compatibility and preventing irritation upon application. Generally, the normal skin pH ranges from 5.5 to 7.0. The pH of the prepared herbal crack heel cream was found to be within the acceptable range, suggesting that the formulation is suitable for topical use and is less likely to produce skin irritation or discomfort[18].

• Sensory evaluation

Sensory evaluation is carried out to assess the physical acceptability of topical preparations such as creams and ointments using human senses. In herbal crack heel cream, this test is useful for examining characteristics including color, odor, texture, consistency, smoothness, and overall appearance. These properties are important because they affect the ease of application and patient acceptance of the formulation. An ideal crack heel cream should be smooth, semisolid, and free from lumps or coarse particles. The formulation should spread easily on the skin without producing irritation or excessive greasiness. The prepared cream showed good homogeneity, smooth texture, acceptable appearance, and satisfactory consistency, indicating good sensory quality and suitability for topical application.

• Colour

Colour is one of the important physical evaluation parameters for creams and other semisolid formulations. It plays a significant role in improving the visual appearance and overall acceptability of the product by users. An ideal cream should possess a uniform and stable colour without the presence of spots, fading, or discoloration. Any alteration in colour during storage may suggest chemical instability or deterioration of the formulation. The colour of the prepared herbal crack heel cream was examined visually in daylight to check its appearance and uniformity. A small amount of the formulation was inspected carefully for even colour distribution. The cream exhibited a consistent light brown to



creamish appearance because of the incorporation of Semecarpus anacardium extract. No signs of uneven colouring, darkening, or phase-related discoloration were noticed, indicating good formulation stability and proper mixing of ingredients. [19].

• Moisturizing property

The moisturizing property of the crack heel cream was assessed by applying a small quantity of the formulation to the skin and monitoring its effect on skin hydration, softness, and smoothness over a period of time. An effective moisturizing cream should help maintain adequate skin moisture, reduce dryness, and improve the texture of the skin without producing any irritation or discomfort. The formulated herbal crack heel cream demonstrated satisfactory moisturizing performance. Following application, the treated skin appeared softer, smoother, and well hydrated, suggesting good emollient and moisture-retaining characteristics of the formulation. The herbal ingredients along with the cream base helped in preventing excessive moisture loss from the skin and supported maintenance of skin hydration[20].

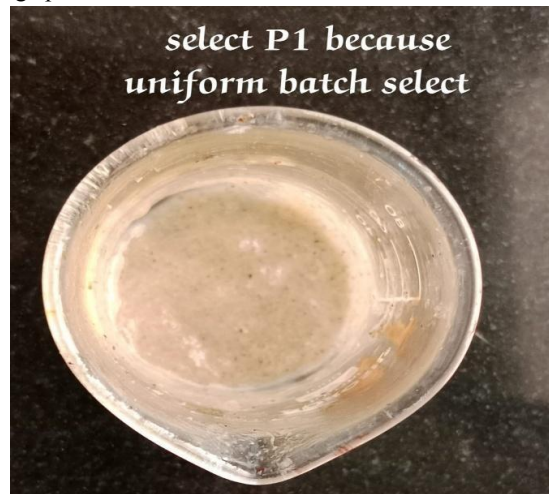
III. RESULT AND DISCUSSION

A. Phase separation

- Fill about 5–10 g cream in centrifuge tube.
- Centrifuge at 3000 rpm for 30 minutes.
- Observe for any separation of phases

Result Interpretation

- Uniform batch select
- No phase separation → Cream is stable.
- Visible separation/cracking → Cream is unstable.
- Standard/Expected Result
- A good crack heel cream should show:
 - No phase separation
 - Smooth texture
 - Stable appearance during storage period



B. Physicochemical Properties (pH Value)

- P1- 4
- P2 - 5.5
- P3- 4.2



Paper pH method

pH Paper Method for Crack Heal Cream Procedure:

Take 1 g cream in a beaker Add 10 mL distilled water. Mix well to form a uniform solution/dispersed mixture. Dip the pH paper strip into the mixture for 1–2 seconds.

Remove the strip and allow the color to develop. Compare the color with the standard pH color chart. Record the observed pH value.

Observation:

- Greenish-yellow color → acidic pH
- Green color → neutral/slightly acidic pH
- Standard pH Range for Cream
- pH=5.5 to 6.5

Result

The prepared crack heal cream showed pH within acceptable skin pH range and was found suitable for topical application. P2 are selected because PH range 5.5





C. Sensory evaluation

-Grittiness-

Grittiness procedure of crack heal cream

Grittiness Test Procedure for Crack Heal Cream Grittiness test is used to check whether your cream has coarse particles or rough texture. A good crack heel cream should be smooth and free from gritty particles.

Materials Required

Glass slides (2),Spatula,Sample cream,Light source

Procedure

Take two clean and dry glass slides.Place about 100–200 mg of crack heal cream on one slide.Put the second slide over it.Press gently and spread the cream to form a thin film.Observe the film under light and rub slightly between fingers.

Check for any:

Hard particles,Roughness,Grainy texture Result Format

Observation: Smooth texture without coarse particles.

Result:

The formulated crack heal cream was found to be free from grittiness and showed good homogeneity.

Standard/Ideal Result

Cream should be: Smooth,Uniform,Non-gritty,Easily spreadable.

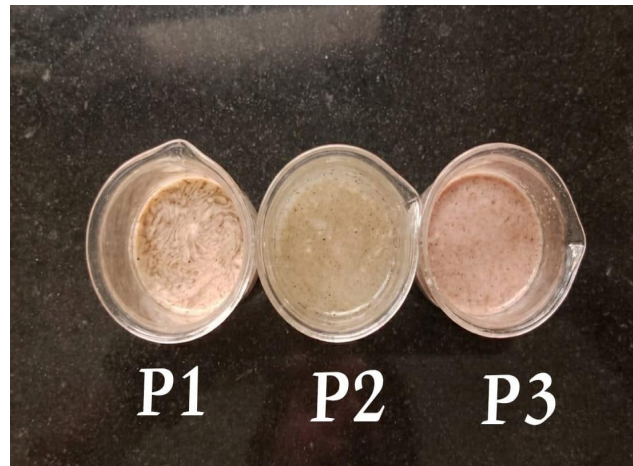
The formulation showed acceptable texture with grittiness observed due to herbal powder particles

D. Colour – P1 -Dark brown spot

P2- whitish brown

P3- Normal brownish spot





Odour- Characteristic pleasant herbal odour

E. Moisturizing property

Procedure,

- Weigh dry Whatman filter paper.
- Apply cream or water sample.Keep for specific time.Reweigh paper.
- Calculate moisture retained or absorbed.
- Dry paper,weight paper,water absorbance.



Moisture retention(%) = $\frac{w_2 - w_1}{\text{Initial water weight}}$

= $\frac{0.74 - 0.69}{0.27}$

= $\frac{0.05}{0.27}$

= 0.18%

Result- The moisture content of the formulated crack heel cream was found to be within acceptable limits, indicating good stability and adequate moisturizing property of the formulation.”

IV. CONCLUSION

This ancient medicinal plant has potent phytochemicals that have anti-inflammatory, antibacterial, and potent wound-healing properties. Before formulation, careful purification and standardization are required since the raw form might be irritant or harmful. Its tissue-repair and skin-regenerating activities make it extremely useful in crack-heal creams. In



this formulation, it helps soften hard skin, close deep fissures, lessen pain, prevent secondary infections, and promote faster epithelialization. Overall, it is a great natural ingredient for creating safe and effective crack-heal and skin-care products [2][16].

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