

Formulation And Evaluation of Herbal Foot Crack Cream by Using Rosmarinus Leaves

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Abstract—The objective of this research is to develop and assess an herbal cream designed for the treatment of cracked heels, utilizing the synergistic effects of almond oil, glycerin, turmeric, and. Cracked heels are a prevalent *Rosmarinus Officinalis* dermatological issue characterized by painful fissures in the heel skin, often resulting from dryness and sustained pressure. This study aims to create a safe and entirely natural solution to relieve this condition. The natural components selected for the formulation of the herbal cream are well-known for their skin rejuvenating properties. The extract of *Rosmarinus Officinalis* leaves was included for its potential anti-inflammatory effects, while almond oil was selected for its deep moisturizing and emollient characteristics. Glycerin was added as a humectant, contributing to the cream's moisturizing and emollient qualities.

Index Terms—Herbal Heel Crack Cream, Foot cream, healing cream, skin moisture meter, dry skin treatment, anti-inflammatory, antimicrobial, wound recovery.

I. INTRODUCTION

The feet act as the body's foundation. It is essential to prioritize the health of our feet and nails just as we do for any other body part. During physical activities, sports, and various daily tasks, force is transmitted through the hands and feet, with the feet enduring the majority of this pressure.

THE FOOT

The human foot consists of 26 small bones intricately connected by a well-structured network of ligaments, muscles, tendons, and cartilage. Elastic tendons link the muscles to specific regions of the foot, enabling movement through muscle contraction. More than a hundred ligaments work to maintain the integrity of

these structures, with the long plantar ligament being the most robust, serving as a trampoline to absorb shock and support body weight.[1] The foot's architecture includes two main arches that function as springs or shock absorbers, each made up of a series of bones, strong ligaments, and cartilage. The feet are designed to serve two fundamental purposes: providing support and facilitating mobility. The heel serves as a stable foundation for standing, while the toes and forefoot are primarily engaged in walking. The strength and flexibility of our feet affect our walking patterns, which in turn influence our posture and weight distribution. Neglecting foot care can result in stiffness or weakness, potentially leading to problems such as back pain, leg cramps, and fatigue.[2]

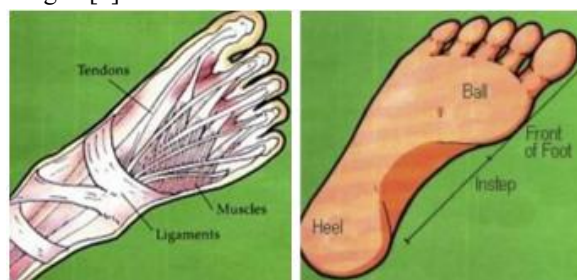


Fig1. THE FOOT

FOOT PROBLEMS:[3]

Influence Of Footwear

Cracked heels are indicative of inadequate foot care rather than simply being caused by excessive exposure or lack of moisture. Known medically as heel fissures, these linear wounds primarily impact the epidermis but may occasionally penetrate the dermis, leading to discomfort. Excessive pressure on the foot pads causes the feet to expand sideways, resulting in cracks when the surrounding skin is dry. The presence of dry,


cracked heels may also indicate deficiencies in zinc and omega-3 fatty acids. While cracks can appear on any part of the body, they are most frequently located at the heel rim and between the toes, which are areas that experience significant use. Xerosis, or dry skin, is a common contributor to cracked heels, along with thick or callused skin around the heel rim. Many foot problems arise from neglecting foot care, making conditions such as cracked heels and corns largely preventable. Although cracked heels are typically not dangerous, deep fissures can become painful and bleed, potentially leading to infections, particularly in individuals with chronic conditions like diabetes or those with weakened immune systems due to age or illness, which can impede healing. Cracked heels are especially prevalent among seniors or individuals who spend extended periods on their feet, as the pressure




on the foot pads increases. Furthermore, sebum production decreases with age, resulting in dry and cracked heels. Seniors often suffer from excessively dry, peeling skin and recurrent dry skin issues on the heels, which may affect one or both heels.



Fig 2. Foot crack heels

Drug Profile

Name of drug	Botanical classification	Chemical constituents	Uses
1. Rosmarinus officinalis leaves 	Synonyms: <i>Bruschia frutecarpa</i> Bertol.; <i>Nyctanthes dentata</i> Blum.; <i>Nyctanthes tristis</i> Salisb., nom. Superfl.; <i>Pariium arbor-tristis</i> (L.) Gaertn.; <i>Scabita scabra</i> L. Biological source: Rosemary is biologically sourced from <i>Salvia rosmarinus</i> Spenn. (Formerly <i>Rosmarinus officinalis</i> L.), an aromatic, perennial shrub in the Lamiaceae (mint) family. It is native to the Mediterranean region and widely cultivated for research into its high-value bioactive compounds, including carnosic acid, carnosol, and rosmarinic acid. Family: Lamiaceae Genus: <i>Salvia</i> Species: <i>Salvia rosmarinus</i>	Rosemary (<i>Rosmarinus officinalis</i>) leaves are a complex source of bioactives, rich in antioxidant phenolic diterpenes (carnosic acid, carnosol), phenolic acids (rosmarinic acid), and volatile essential oils including 1,8-cineole (15.55%), α -pinene (9.26%), and camphor (5–21%).	Medicinal uses: <ul style="list-style-type: none"> • They support cognitive function (memory and focus), improve mood, aid digestion, reduce pain (e.g., arthritis), and promote hair growth. • Rich in carnosic and rosmarinic acid, rosemary boosts immunity and may help manage blood sugar.
2. Turmeric	Synonyms: <i>Rhizoma curcuma</i> .	The biological source of turmeric is the desiccated rhizome of	Medicinal uses: <ul style="list-style-type: none"> • Anti-inflammatory Properties: Curcumin, the

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	<p>Biological source: Turmeric's biological source is the dried rhizome of the plant <i>Curcuma longa</i>, also known as <i>Curcuma domestica</i> Valetton. This rhizome is a type of underground stem that acts as the root for the turmeric plant. The rhizome comes from the plant <i>Curcuma longa</i>. Drying: The rhizomes are dried.</p> <p>Family: Zingiberaceae (Ginger family) Genus: <i>Curcuma</i> Species: <i>Curcuma longa</i> (Turmeric)</p>	<p>the <i>Curcuma longa</i> plant, commonly referred to as Curcuma domestica Valetton. This rhizome serves as an underground stem that functions as the root of the turmeric plant. The rhizome is sourced from <i>Curcuma longa</i>. Prior to being processed into yellow powder recognized as turmeric, the rhizomes undergo a drying process. The plant is indigenous to the tropical regions of South Asia.</p>	<p>active compound in turmeric, is known for its strong anti-inflammatory effects, potentially aiding in conditions like arthritis and inflammatory bowel disease.</p> <ul style="list-style-type: none"> • Antioxidant Effects: Turmeric's antioxidants can help protect against free radicals, which may contribute to aging and disease.
Name of drug	Botanical classification	Chemical constituents	Uses
<p>3. Almond oil</p> 	<p>Synonyms: —</p> <p>Biological source: Almond oil is derived from the seeds of the almond tree, scientifically referred to as <i>Prunus dulcis</i>. It is extracted from the seeds both the sweet almond (var. <i>Dulcis</i>) and bitter almond (var. <i>Amara</i>) varieties. Almond trees are originally from the Middle East and are now cultivated in numerous regions around the world.</p> <p>Family: Rosaceae Genus: <i>Prunus</i> Species: <i>Prunus dulcis</i></p>	<p>Almond oil is predominantly made up of oleic acid, a type of monounsaturated fatty acid, along with other fatty acids such as linoleic, palmitic, and stearic acids. Additionally, it contains tocopherols, especially α-tocopherol, which is a variant of vitamin E.</p>	<p>Skin Care:</p> <ul style="list-style-type: none"> • Hydration: The fatty acids in almond oil effectively retain moisture, ensuring that skin remains soft and elastic. • Anti-aging Benefits: The presence of vitamin E and various antioxidants helps neutralize free radicals, thereby minimizing the appearance of fine lines and wrinkles. • Relief from Inflammation: It calms irritated skin and alleviates conditions such as eczema and psoriasis, leading to a reduction in redness.
<p>4. Glycerine</p> 	<p>Chemical Name: Glycerol</p> <ul style="list-style-type: none"> • IUPAC Name: Propane-1,2,3-triol • Molecular Formula: $C_3H_8O_3$ • Molar Mass: 92.09 g/mole 	<p>Glycerol, commonly referred to as glycerin, is a transparent, odorless, viscous, and colorless liquid that possesses a sweet flavor. It is a nontoxic, non-hazardous, and</p>	<p>Moisture Retention: Glycerine is a powerful humectant, meaning it attracts and retains moisture from the environment. When used in a hair growth spray, it helps.</p>

Name of drug	Botanical classification	Chemical constituents	Uses
	Biological source: Glycerine, commonly referred to as glycerol, is obtained from natural fats and oils present in both plant and animal sources.	biodegradable substance present in all natural fats and oils. Glycerol serves multiple purposes across the food, pharmaceutical, and personal care sectors. In terms of its chemical characteristics, glycerol is hygroscopic.	Scalp Health Support: A well-hydrated scalp is less prone to issues like dryness, flaking, or irritation—all of which can inhibit hair growth. Glycerine helps maintain the scalp's moisture barrier promoting overall scalp health.

Formulation table:

Sr. No	Ingredients	Function	Quantity(50g)
1	Rosmarinus Officinalis extract	Healing agent	0.3 g
2	Turmeric powder	Antimicrobial	1 g
3	Almond oil	Moisturizer	8 ml
4	Glycerine	Humectant	5 ml
5	Potassium hydroxide	pH adjusts	2 g
6	Methyl paraben	Preservatives	1 g
7	Stearic acid	Thickener,emulsifier	10 g
8	Lanolin	Skin protecting, emollient	3 g
9	Water	Vehicle	20 l

- Extraction Method
- Rosmarinus Officinalis Leaves Extraction:
 - Collect fresh Rosmarinus Officinalis leaves, wash them thoroughly
 - Dry them in a shaded area to preserve their bioactive properties.
 - Once dried, grind the leaves into a fine powder to increase the surface Area for Extraction.
 - Mx the powder leaves with ethanol in a specific ratio (e, g,1:10 w/v).
 - The mixture is then subjected to process (Maceration).
 - After Extraction, filter the mixture to separate the liquid extract from the solid residue.

Method of Preparation

1. Prepare the Extracts

Dry and crush Rosmarinus Officinalis leaves separately. Macerate In ethanol 75%) for 48–72 hours using a 1:10 w/v ratio. Filter and Concentrate using a

water bath at 40–50°C.Measure approx. 10ml of each Concentrated extract for use.

2. Mix the Ingredients

1. Weight all the required ingredients for herbal cream properly and keep Them Separately.
2. Take stearic acid, lanolin, in beaker and melt at 60°c.
3. Take another beaker and add glycerine, potassium hydroxide, and water. Heat upto 60°
4. Add preparation of first beaker into the second beaker drop by drop. With continuously Stirring.
5. Add the herbal extract to the mixture and stir continuously.
6. After cooling add methyl paraben, mix and stir continuously
7. Add turmeric powder mixed with add fragrance almond oil mix Thoroughly to obtain Uniformproduct.
8. Stored it in closed container in cool place.

II. EVALUATION PARAMETERS:

1. Physical appearance:

The physical appearance of the formulation was Checked visually.

- Colour: The colour of the formulations was checked out against white & Black backgrounds.
- Consistency: The consistency was checked by applying the cream on to the skin.
- Greasiness: The greasiness was assessed by the application on to the skin.
- Odour: The odour of the cream was checked by mixing a little amount of

Cream in water and by Taking smell

2. Determination of pH

The pH values of 1% aqueous solutions of the optimize Cream was measured at 25°C using a pH meter.

3. Spreadability:

The Spreadability of the cream formulations was determined by measuring the Spreading diameter of 1 g of cream between two horizontal Plates (20 cm x 20 cm) after one min.

4. Irritancy test:

Mark an area (1sq.cm) on the foot dorsal surface. The cream Was applied to the Specified area and time was noted, Irritancy, erythema, Oedema, was checked if any for regular Intervals up to 24 hrs. and reported.

5. Viscosity Test:

Viscosity of formulated creams can be determined by using Brookfield viscometer.

III. RESULT

An herbal crack cream can be formulated using Almond oil, Turmeric, Glycerine, and lanolin. This cream is effective for treating Cracked heels. It can be inferred that herbal creams, which are free from Side effects and possess anti-inflammatory properties, can serve as a Protective barrier for the skin. Improvement in skin moisture levels. Increased elasticity: better skin flexibility and minimized cracking. Alleviated discomfort: Reduced pain and itching linked to dry, cracked Feet. Excellent application and removal:

Simple to apply and wash off. Optimal pH and viscosity: Appropriately aligned with the skin's natural pH and a pleasant texture.

IV. CONCLUSION

The development and assessment of an herbal cream for Treating foot cracks have been finalized.

This cream is specifically Formulated to combat dryness, cracking, and discomfort in the feet while reducing the likelihood of skin irritation. In summary, the analysis and Extraction of the heel crack cream utilizing Rosmarinus Officinalis leaves Have yielded encouraging results. The research findings suggest that a heel Crack cream made with Rosmarinus Officinalis extract could significantly Enhance foot care products by addressing issues such as dryness, itchiness, and irritation associated with heel cracks. Additionally, the cream's Potential antimicrobial and anti-inflammatory properties, derived from Rosmarinus Officinalis, may provide further benefits in preventing Infections and promoting wound healing. Future studies could build upon These findings Rosmarinus Officinalis by evaluating the cream's effectiveness in clinical settings, Optimizing the formulation for better performance, and investigating the Potential applications of in skincare products. Overall, this research underscores the importance of natural ingredients Like Rosmarinus Officinalis extract in developing effective and gentle Skincare solution.

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