Formulation and Evaluation of Herbal Foot Crack Cream

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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 Nyctanthus Arbortristis. Cracked heels are a prevalent 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 Nyctanthus arbortristis 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 Antimicrobial, Wound Recovery Cream, Healing Cream, Skin Moisture Meter**

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 traditional systems of medicine evolved over centuries had responsible for safeguarding of the world until the allopathic system of medicine. As the latter system used knowledge of modern biology and chemistry, for both discovery and treatment, it found fast acceptability among the users and now it occupies predominant space in the area of healthcare. Inspite of this, the contribution of the traditional preparations is increasing because of the general impression that these products are safe; while the single molecule based modern drugs used in the allopathic system can have severe adverse effects. World health organization (WHO) has been promoting traditional medicine as a source of less expensive, comprehensive medical care, especially in developing countries, 8% of the world's population relies on medicinal plants for their primary health care.

II. INTRODUCTION TO SKIN

Skin is the largest organ in our body and helps serve as a protective barrier against environmental factors.
The skin contains three main layers (epidermis, dermis, hypodermis) (fig.1) to prevent skin cancer, acne,
wrinkles, and rashes. The skin of the feet is classified as thick skin and contains five distinct layers stratu

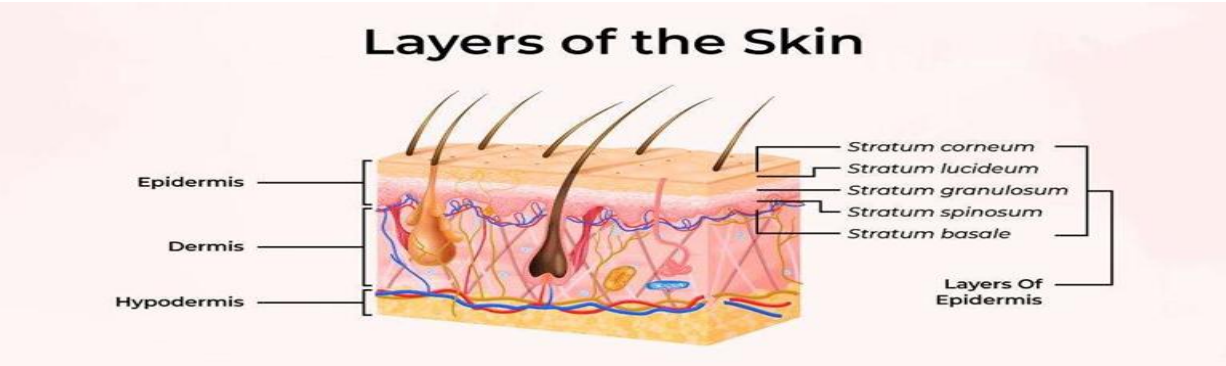

Fig. No.: 1 Anatomy of skin

III. 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. 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. foot care can result in stiffness or weakness, potentially leading to problems such as back pain, leg cramps, and fatigue. 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.

IV. INTRODUCTION TO FOOT CRACK

Cracked, often due to lack of moisture or increased pressure.[4] Cracked heels are a common foot problem where the skin on the heel's splits or cracks, forming fissures. The primary cause is dry, thickened skin, often due to A lack of moisture, but other factors can contribute. Initially, you might notice dry, thickened skin (calluses). Around the heel, which then develops into cracks or fissures. Cracked heels can range from a minor nuisance to a painful condition, especially if the cracks are deep or infected. Deep cracks can lead to pain, bleeding, and Potentially infection.

Xerosis: Xerosis cutis is the medical term for abnormally dry skin. A less severe form of xerosis is xeroderma or normal dry skin. While xerosis is often a temporary condition that leaves the skin looking scaly, it can also Cause discomfort, itchiness, and inflammation. If left untreated, this condition can cause breaks or cracks in the skin and lead to bacterial infection.

Fig. No.: 2 Foot Cracks

Name of drug:

1. Nyctanthus arbortristis leaves,
2. Turmeric,
3. Almond oil,
4. Glycerin

Fig. no. 2 cycle dig of ingredients and making procedure

1. Nyctanthes arbor tristis, commonly known as Parijat, Harsingar, or Night Jasmine, is a medicinal plant highly valued in Ayurvedic and traditional systems of medicine for its broad therapeutic potential. Its leaves, characterized by their rough, sandpaper like texture and bitter taste, are the most frequently used part of the plant for treating inflammatory and chronic conditions.

Table. No.: 1 Nyctanthus arbortristis leaves

Kingdom	Plantae
Subkingdom	Tracheobionta (Vascular plants)
Super division	Spermatophyta (Seed plants)
Division	Magnoliophyta (Angiosperms)
Class	Magnoliopsida (Dicotyledons)
Subclass	Asteridae
Order	Lamiales
Family	Oleaceae (Olive family)
Genus	Nyctanthus
Species	Nyctanthus arbor-tristis L.

2. Turmeric

2.1 Botanical classification

Table. No.: 2 Turmeric

Taxonomic Rank	Classification
Kingdom	Plantae
Subkingdom	Tracheobionta (Vascular plants)
Super division	Spermatophyta (Seed plants)
Division	Magnoliophyta (Angiosperms)
Class	Liliopsida (Monocotyledons)
Subclass	Commelinidae
Order	Zingiberales
Family	Zingiberaceae
Genus	Curcuma
Species	Curcuma longa L.

2.2 Synonyms: Bruschia macrocarpa Bertol. Nyctanthes dentata Blume Nyctanthes tristis Salish, nom. Superfl Parilium arbor-tristis (L.) Gaertn. Scabrita scabra L Biological source: Nyctanthus arbortristis leaves are derived from the nyctanthus Arbortristis plant (parijat), the plant is native to South Asia and is widely Distributed in india and other parts of Southeast Asia

2.3 Chemical constituents: The leaves of Nyctanthes arbor-tristis are rich in chemical such as various compounds, flavanol Glycosides, D manndol B sitostero1, astragalin, nicotiflorin, oleanolic acid, nyctanthic acid, Ascorbic acid, and tannic acid Furthermore, they also contain resinous materials, amorphous Glycosides, amorphous resins, small quantities of volatile oils, carotene, friedelin, lupeol, mannitol, Glucose, fructose, iridoid glycosides, and benzoic acid The biological source of turmeric is the desiccated thizome of the Curcuma longa plant, commonly Referred to as Curcuma domestica Valeton This thizome serves as an underground stem that Functions as the root of the turmeric plant.

3. Almond oil

Table. No.: 3 Almond oil

Taxonomic Rank	Classification
Kingdom	Plantae
Subkingdom	Tracheobionta
Super division	Spermatophyta
Division	Magnoliophyta (Angiosperms)
Class	Magnoliopsida (Dicotyledons)
Subclass	Rosidae
Order	Rosales
Family	Rosaceae
Genus	Prunus
Species	Prunus dulcis (Mill.) D.A. Webb

3.1 Biological source: Almond oil is derived from the seeds of oil fatty Almond predominantly made up of oleic acid, a type of monounsaturated Skin Care Hydration. The fatty acids in almond oil effectively retain moisture, ensuring the International Journal of Novel Research and Development

V. FORMULATION AND EVALUATION TESTS OF HERBAL FOOT CRACK CREAM

Table. No.: 4 Formulation Table

Sr. No.	Ingredient	Function	Quantity
1	Nyctanthus arboreus extract	Healing agent	3 g
2	Turmeric powder	Antimicrobial	1g
3	Almondoil	Moisturizer	8ml
4	Glycerine	Humectant	4ml
5	Potassium hy drox ide	pH adjuster	1g
6	Methyl paraben	Preservative	1g
7	Stearic acid	Thickener, emu1sifier	10g
8	Lanolin	Skin-protecting emollient	2g
9	Water	Vehicle	201

5.1 Method of Preparation (Procedure)

Step 1: Preparation of Herbal Extracts
Collect neem leaves, turmeric rhizome, and parijat leaves. Dry them in shade and grind into coarse powder. Extract using water or hydro-alcoholic solvent by maceration. Filter and concentrate the extract.

Step 2: Preparation of Oil Phase
Take beeswax, stearic acid, and liquid paraffin in a beaker. Heat at 70-75°C until completely melted.

Step 3: Preparation of Aqueous Phase
Dissolve borax, glycerin, methyl paraben in purified water. Heat the aqueous phase to the same temperature (70-75°C).

Step 4: Emulsification
Slowly add the aqueous phase to the oil phase with continuous stirring. Stir until a uniform cream is formed.

Step 5: Addition of Herbal Extracts
Allow the cream to cool below 40°C.
Add neem, turmeric, and parijat extracts slowly with stirring.

Step 6: Final Adjustment Add
perfume. Adjust volume with rose water. Mix thoroughly to obtain a smooth, homogeneous cream.

Step 7: Packing
Transfer the cream into clean, labeled containers.

VI. EVALUATION TEST OF HERBAL FOOT CRACK CREAM

Physical Appearance: Color, odor, texture, and consistency are observed visually.

pH Determination: pH measured using digital pH meter. Ideal pH: 5.5 7.0 (skin compatible).

Spreadability: Cream placed between two glass slides. Time taken to spread under a fixed weight is measured. Good spreadability indicates easy application.

Homogeneity: Cream checked visually for uniformity and absence of lumps.

Viscosity: Measured using Brookfield viscometer. Indicates thickness and flow property.
Washability: Cream applied on skin and washed with water. Ease of removal observed.

Irritancy Test: Small quantity applied on skin. Observed for redness, itching, or irritation for 24 hours.

Stability Study: Stored at different temperatures (room temperature, 40°C). Observed for phase separation, color change, and odor.

Antimicrobial Activity (Optional): Tested against skin pathogens using agar diffusion method. Zone of inhibition measured.

VII. 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 Nyctanthus arbortristis leaves Have yielded encouraging results. The Research findings suggest that a heel Crack cream made with Nyctanthus arbortristis 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 Nyctanthus arbortristis, may provide further benefits in Preventing Infections and promoting wound healing. Future studies could build upon These Findings by evaluating the cream's effectiveness in clinical settings, Optimizing the formulation for better performance, and investigating the Potential applications of Nyctanthus arbortristis in Skincare products. Overall, this research underscores the importance of natural ingredients Like Nyctanthus arbortristis extract in developing effective and gentle Skincare solutions.

Result: A 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.

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