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FORMULATION AND EVALUATION OF HERBAL CRACK HEEL CREAM FROM PLANT EXTRACT

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- **Abstract -** Our primary goal in doing this research was to create an anti-crack heel cream formulation with cocoa butter, beeswax, aloe vera, turmeric powder, rose water, vitamin E capsule, coconut oil etc. to treat cracked heels.
- **Methods -** A cream formulation that prevents cracked heels that includes cocoa butter, bees wax and aloe vera extract essential oils were ready. studies on microbiological were done to determine whether the ingredients in the formulation were safe and effective for therapy for cracked heels.
- **Result** - It was discovered that the cream made with cocoa butter, aloe vera, beeswax, was both safe and effective for the therapy for cracked heels.
- **Conclusion** - In conclusion, it can be said that herbal creams with anti inflammatory properties that don't causes adverse effect can be utilized as provision of a skin protecting barrier. All ages are affected by the many different types of skin diseases, which are common heath issue.

- **INDRODUCTION**

Skin is the largest organ of the body, functions are the necessary interface between the internal and external environment. Thus, it continuously protects the body from noxious stimuli, e.g microorganisms, ultraviolet (UV) irradiation, allergens, and irritants. Its unique role and function are a direct result of its structure and makeup, particularly of the most superficial part, the epidermis. The main cellular component of the epidermis includes keratinocytes, but there are also melanocytes, Markel cells, gamma delta T-lymphocytes, and Langerhans cells. Keratinocytes The granular and spinous layers of the epidermis can form as long as the basal layer of the epidermis is growing upward. Moving past the granular layer, the keratinocytes terminally differentiate into corneocytes in the horny layer. In the outmost part of epidermis, corneocytes (compact keratinocytes without nuclei), together with the intracellular lamellar compartment (lipids), contribute to the structure and function of the stratum corneum (SC).

Crack Heel Repair Cream comes with the healing power of herbs moisture, heals, soothes (Specialized heel care cream) softness , hydrates and shields with its unique action. Crack heel cream heals and soothes dry skin conditions like cracked and rough heels, chapped hands, fissures, and chilblains. Helps in healing rough and cracked heels. Hydrates dry skin of heels and makes it soft. Additionally advantageous in the event that minor burns, cuts and wounds. Crack Heel cream Is fortified with willing power of herbs, which helps to soften crack, rough skin.

- **WHAT ARE CRACKS?**

Cracks are breaks in your skin. They may be the result of skin that is too dry. Due to the dryness skin become rough. A large fissure often forms on the base of the heel. Observe your daily rooting and if you identify anything affecting.

- **CAUSES AND RISK FACTORS -**

Cracked heels are most commonly caused by extremely dry skin. For the majority of people, cracked heels are merely aesthetic and do not create any additional issue.

The following are some of the risk factors and conditions –

1.Obesity

2.Diabetics

3.Eczema and Psoriasis

4.Long periods of standing or walking on hard surfaces

5. Thyroid issues

6.Vitamins and mineral deficiencies

7. Genes

8.Oestrogen deficiency

9.Peripheral neuropathy is condition that affects the peripheral nerves

10.Unusual circulation

11.Constantly wearing shoes

- **INTRODUCTION OF CREAM**

Replacement of synthetic harmful chemical with natural safe herbal extracts is vital part of the study which reduce the side effect of the formulation and also reduce long term environmental problems. Above all, it is a ecofriendly product used for human beings. It is thought that the most effective method for softening and removing cracks is to use heel cream. They function as barrier guards, moisturizers, or repair creams. But with so many treatments available these days, it can be challenging to determine which cream is best for treating your heel. Emollient lotion helps with small burns, cuts, and wounds and can reduce pain and dryness as well as improve the appearance of heel cracks. Crack heel cream is designed specifically to give you effective relief from sore, cracked heels and hardened soles. Crack happy feet repair is fortified with the healing power of herbs, which helps to soften cracked, rough skin. Cracked heels can be a common problem, and there are various creams available that can help to moisturize and heal them.

Here are few ingredients to look for in a good crack heel cream:

- Urea:- urea is a powerful moisturizer that can help to soften and hydrate dry, cracked skin.
- Salicylic acid:- Salicylic acid can aid in dead skin cell exfoliation and promote the growth of new, healthy skin.
- Lactic acid :- lactic Acid is useful for exfoliation and moisturizer the skin improving its texture and appearance.
- Cocoa butter :- Cocoa butter is a rich, natural moisturizer that can help to sooth and heal dry, cracked skin.
- Vitamin E :- vitamin E is an antioxidant that can help to protect the skin from damage and promote healing.

When looking for a crack heel cram, choose one that contains one or more of these ingredients.

When looking for a crack heel cream, choose one that contains one or more of these ingredients. Be sure to follow the instructions carefully and supply the cream regularly for the best results.

Cream formulation parameters refers to the various elements that must be taken into account when formulating a cream, such as the type and amount of ingredients used, the manufacturing process, and the desired properties of the final product

Here are some of the key parameters to consider –

1) Type and amount of active ingredients: - The active ingredients are the components that provide the therapeutic or cosmetic benefits of the cream. The type and amount of active ingredients utilized will vary based on the desired effect of the cream.

2) Type and amount of excipients: - Excipients are the inactive ingredients used to formulate the cream, such as emulsifiers, thickeners, preservatives and moisturizers. These ingredients play a critical role in the stability, texture, and effectiveness of the cream.

3) Manufacturing process: - The manufacturing process can also affect the quality cream. Factors s as well as the steadiness of the such as temperature, mixing speed, and the addition of ingredients in order need to be carefully controlled

4) pH :- The pH of the cream can affect its stability, texture, and effectiveness. Depending on the type of active ingredients used, the pH may need to be adjusted to ensure the cream is effective and safe.

5) Texture and consistency: - The texture and consistency of the cream can affect how it spreads and absorbs into the skin. The type and amount of emulsifiers and thickeners used can be adjusted to achieve the desired texture and consistency.

ADVANTAGES OF CRACK HEEL CREAM –

Crack heel creams can offer several advantages for people suffering from dry, cracked skin on their feet.

Here are some of the advantages of using crack heel cream:

1. Moisturize dry skin- Hydrating dry skin is one of the main benefits of applying crack heel cream. cocoa butter, coconut oil are just few of the component including many crack heel treatment that can help hydrate the skin and stop further drying out.
2. Heals cracked creams- Crams for crack heels can also aid in the healing of fissures and cracks that may appear on dry, rough skin.
3. Reduce irritation- Anti-inflammatory components like aloe vera, which are include in some crack heel creams, can help reduce inflammation and soothe irritated skin.
4. Prevents infections- While cracked heels can be more prone to infection, applying a crack heel cream can help to keep the skin healthy and moisturized.
5. Enhance appearance- Applying a crack heel cream can also aid in enhancing the appearance of rough, dry skin on the feet. Frequent use can lead to softer, smoother skin that feels and looks better.

❖ **MECHANISAM OF CREAM:**

✓ Attract - Components draw moisture to heels from the inside out.

✓ Lock - Component keep moisture at the heels.

✓ Heal – organic extracts soothe pain, edema and soften heels.

DIRECTION FOR USE:

Wash and clean the affected area, wipe it dry. Then apply crack cream two to three times a day. Spread gently. Allow 15min to dry after application.

FEATURES OF CREAM:

- No greasy stains
- No rash effects on the skin
- Hydrates and soothes the skin
- Helps to repair dry skin

AIM AND OBJECTIVES

Aim:

Our project's primary goal was to formulate and evaluate Herbal Anti-Crack Heel cream.

To prepare the anti-crack heel cream of herbal ingredients, consist of

- Aloe barbadensis miller
- Curcuma longa
- Cocos nucifera

For the treatment of cracked heels.

OBJECTIVES:

- To Produce Moisturizing and Anti-Crack heel Cream.
- To give instant relief from cracked heels and excessive dryness.
- To Provide Antiseptic properties to the cracked heels.
- To Reduce Unpleasant smell/odour.
- To restore softness and repair cracked heels.

❖ **Drugs and Excipients Profile**

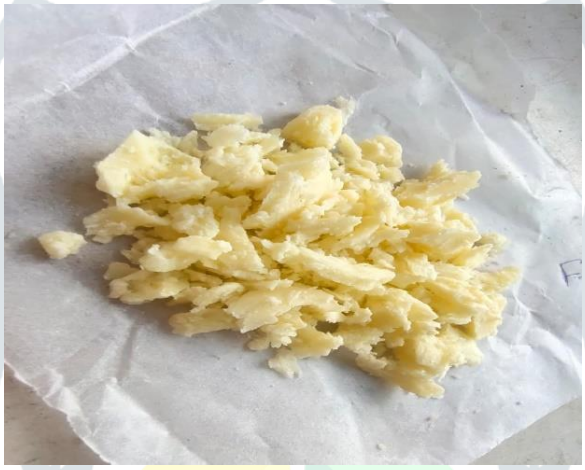
1. Beeswax:

- **Synonyms:** Cera Flava, Cera Alba, Yellow wax, Yellow Beeswax, White Beeswax.
- **Biological Source:** It is obtained from the honey comb of the bees Apis Mellifera, Apis dorsata and other species of Apis.
- **Family:** Apidae.
- **Geographical source:** France, Italy, West Africa, India and Jamaica.

- **Chemical constituents:** Unhydrolyzed Beeswax consists of approximately 71% esters, 15% hydrocarbon,8% free fatty acid and 6% other components.
- **General Description:** Beeswax is a product made from the honeycomb of the honeybee and other bees. The mixing of pollen oils into a honeycomb wax turns the white wax into a yellow or brown colour.
- **Uses:**

1. Softness the skin.
2. Relieves dry skin disorders such as rough and cracked heels, Chapped hands, Fissures and chilblains.
3. Also help in minor burns, Cuts, and wounds.
4. Has an antiseptic property, which may help protect the skin from pathogenic microorganism.
5. Provide a protective barrier to the skin.

2. Cocoa Butter:



- **Synonyms:** Theobroma Oil, Cocoa Butter.
- **Biological Source:** It is obtained from roasted seeds of Theobroma cacao L.
- **Family:** Sterculiaceae.
- **Geographical Source:** Cocoa is cultivated in Brazil, Sri Lanka, Philippines, Curacao, Mexico, West Africa(Ghana, Nigeria) and some part of India.
- **Chemical constituents:** It contain Glycerides of Steric acid 34%, Oleic acid 36%
- **General Description:** Cocoa butter also called Theobroma oil is a pale-yellow edible fat extract from the cocoa bean (Theobroma Cacao)
- **Uses:**

1. Helping to heal rough or extra dry skin like cracked heels and dry feet .
2. Moisturizes dehydrated skin.
3. Helps ease dry and itchy skin.

3. Turmeric:

- **Synonyms**: Curcuma longa, saffron Indian, Haldi, Curcuma, Rhizoma curcumae.
- **Biological source**: Turmeric is the dried rhizome of curcuma longa Linn.
- **Family**: Zingiberaceae
- **Geographical source**: It is grown on a larger scale in India, China, East Indies, and Pakistan.
- **Chemical constituents**: Curcumin is the active ingredient of the dietary spice turmeric, Resins, 5% volatile oils, fixed oils and acids.
- **General Description**: The large, simple, oblong leaves of the perennial herb turmeric are borne on a short stem. Its oblong, ovate, or pyriform tubers, or rhizomes, are frequently branched. The rhizomes are orange on the inside, and yellowish brown on the outside.

- **Uses**:

1. Used for disorders of the skin.
2. Clears the skin.
3. Has an anti-inflammatory property.
4. Improves skin health.
5. Act as anti-oxidant, anti-bacterial and soothing.

4. Aloe vera :

- **Synonym**: - Aloe spica, Aloes, Aloes de curacao, Aloes des barbadensis, Cape aloe, Chritkumari.
- **Biological source :** it consist of dried juice of leaves of Aloe barbadensis Miller.
- **Family**: Asphodelaceae, Liliaceae.
- **Geographical source:** Africa, Asia, Europe, and America.
- **General description: -** Aloe vera is an herb with succulent leaves that are arranged in a rosette. The leaves are grey to green and sometimes have white spots on their surfaces.
- **Chemical Constituents** Lupeol, salicylic acid, urea nitrogen, cinnamomic acid, phenols and sulphur.
- **Uses: -**

1. Aloe vera has been traditionally used to treat skin injuries (burns, cuts, insect bites and eczemas)

2. It has anti-inflammatory, antimicrobial, and wound healing properties.

3. Dead skin, hydrates, moisturizes and heals cracks.

4. Repairs and relieves dry skin disorders such as rough and cracked heels.

5. Coconut oil :

- **Synonyms:** coconut oil, coconut butter, copra oil, coconut water, coco palm.
- **Biological source:** coconut oil is the fixed oil obtained by expression or extraction from the seed of the coconut palm.
- **Family:** palmae.
- **Geographic source:** coconut is widely distributed throughout the world. It is largely cultivated is African and south east Asian countries.
- **General description:** coconut oil is yellowish white solid or semi liquid that melt at 23c.
- **Use :**

1. It is natural moisturizing and healing properties.
2. Improve dryness of skin.
3. It has antimicrobial and antioxidant properties.

6.Rose water:

• **Synonyms: -** Attar of roses, eau de toilette, lavender water, scented liquid.

• **Biological source: -** Rose water is flavoured water made by steeping rose petals in water. It is the hydrosol portion of the distillate of rose petals, a by-product of the production of rose oil for use in perfume.

• **Geographical source: -** The Middle East is where the Damask rose originated, and some evidence suggests that Iran is where rose water originated, although the source of its aromatic oil and extracts is Greece.

• **General description: -** Rose petals are distilled using steam to produce rose water. Because rose water smells good, it's occasionally used as a gentle natural scent in place of fragrances that are loaded with chemicals.
perfumes. Rose water has been used for thousands of years, including in the middle Ages.

• **Chemical constituents: -** Simultaneous distillation–extraction has also been utilized to identify the composition of rose water, with phenethyl alcohol (81.27%), citronellol (5.72%), and geraniol (4.43%) reported as the main constituents.

• **Uses: -**

1. Reduces skin redness.
2. Helps prevent and treat infections
3. Contains antioxidants.

7. Vitamin E:

• **Synonym:** - Alpha-tocopherol

• **Biological source:** The following foods contain vitamin E:

: Vegetable oils (such as wheat germ, sunflower, safflower, corn, and soybean oils) Nuts (such as almonds, peanuts, and hazelnuts/filberts) Seeds (such as sunflower seeds**)**

• **Chemical constitution:** Vitamin E is fat soluble, so dietary supplement products are usually in the form of the vitamin, esterified with acetic acid to generate tocopheryl acetate, and dissolved in vegetable oil in a soft gel capsule. For alpha-tocopherol, amounts range from 100 to 1000 IU per serving.

• **Uses:**

Vitamin E helps maintain healthy skin and eyes, and strengthen the body's natural defence against illness and infection (the immune system).

Formulation Table :

Sr.No	Ingredients	Quantity		
		F1	F2	F3
1	Bees Wax	7 gm	8 gm	9gm
2	Aloevera	4 gm	5 gm	6gm
3	CocoaButter	5 gm	6 gm	7gm
4	Coconut Oil	1 ml	2 ml	3ml
5	Vitamin E	1 tablet	1 tablet	1 tablet
6	Turmeric Powder	q.s	q.s	q.s
7	Rose Water	q.s	q.s	q.s

Procedure:

- Take bees wax and coconut oil into the beaker.
- Place the beaker in a hot water bath to melt the wax.
- Add a vitamin E tablet to the mixture.
- Let the ingredients melt.
- Now add the required quantity of turmeric powder.
- Then add cocoa butter and mix it well.
- After mixing and making it a normal, cool it . Add aloe Vera to it, and mix it well.
- Mix well all the mixture and store it in a container
- Apply this mixture to your feet.

EVALUATION PARAMETERS

1) Spreadability: -

The spreadability of samples was determined. Take 0.5 g crack cream formulation was placed within a circle of 1 cm diameter on a glass slide over which a second glass plate was placed. A weight of 500 g was allowed to rest on the upper glass slide for 5 min. Spreadability refers to the area covered by a fixed amount of crack cream sample after the uniform spread of the sample on the glass slide. The increase in the diameter because of the spreading of the test crack cream formulation was noted. Average of 3 determinations was noted.

2) Washability: -

A small amount of cream applied available and washed under running water.

3) PH of the cream: -

PH The pH of the 10 % w/v cream suspension was determined at 25°C using a pH meter standardized using pH 4.0 and 7.0 standard buffers before use and average of triplicates were prepared.

4) Physical Properties: -

- **Colour: -** Yellow
- **Odour: -** Pungent
- **Texture: -** Smooth
- **Appearance: -** Semisolid
- **Consistency: -** Good

OBSERVATIONS:

Parameters	**F1**	**F2**	**F3**
Spreadability	Good	**Great**	Good
Washability	washable	**washable**	washable
PH	7.21	**7.25**	7.31

RESULT AND DISCUSSION

1) Spreadability: - The spreadability of all crack cream formulations was determined and it was observed that formulation F2 has greater spread ability as compared to other batches.

2) Washability: - A small amount of cream applied on the skin surface and washed under running water. The washability of all formulations was easily washable with water. No any stickiness on the skin.

3) pH of the cream: - pH of all the formulations was found to be between 7.21±0.185 to7.31±0.244 that is within the range.

4) Physical properties: - The physical properties and all formulated crack cream were observed by its colour, Odour and texture. The F2 batch Colour was light brown, Odour was pungent and texture was smooth-nonsticky cream like.

DISCUSSION: - Prepared crack cream formulations were subjected to various assessment parameters and the findings obtained were within the limits All formulas were discovered.

alkaline in pH test. All the formulations showed good viscosity. The spread ability of formulation F2 is greater as compared to other formulations. All F1, F2 and F3 formulations are stable at room temperature. Washability of the F2 formulation showed better results as compared to other formulations. F2 was selected as an optimized formulation on the basis of results of spread ability , viscosity and washability.

CONCLUSION

Formulation of Anti Crack Heel Cream was successfully developed that met the relevant pharmaceutical characteristics. The prepared formulations showed good spreadability, no evidence of phase separation and good consistency during the study period. parameters like visual appearance, nature and pH of the formulations showed that there was no significant variation during the study period. The prepared formulations showed proper pH range that is approximately pH 7.25; it confirms the compatibility of the formulations with skin secretions. From the present study it can be concluded that it is possible to develop creams containing herbal extracts and can be used for the treatment of cracked heels. Plants are more potent healers because they promote the repair mechanism in the natural way. The effect of Anti Cracked Heel Cream has it to be experimented and will be done in future.

REFERENCES

1. Patil, V.V., Thorat, Y.S., Kote, N.S. And Hosmani, A.H., 2020. Formulation and Evaluation of Crack Cream from Plant Extracts. *International Journal of Current Pharmaceutical Research*, pp.130-132.

2. Ghildiyal, S., Gautam, M.K., Joshi, V.K. and Goel, R.K., 2012. Pharmacological evaluation of extracts of Hedychium spicatum (Ham-ex-Smith) rhizome. *Ancient Science of Life*, *31*(3), p.117.

3. Ahmed, S., Ahmad, M., Swami, B.L. and Ikram, S., 2016. Green synthesis of silver nanoparticles using Azadirachta indica aqueous leaf extract. *Journal of radiation research and applied sciences*, *9*(1), pp.1-7.

4. Mali, A.S., Karekar, P. and Yadav, A.V., 2015. Formulation and evaluation of multipurpose herbal cream. *International journal of science and research*, *4*(11), pp.1495-1497.

5. Chen, M.X., Alexander, K.S. and Baki, G., 2016. Formulation and evaluation of antibacterial creams and gels containing metal ions for topical application. *Journal of pharmaceutics*, *2016*.

6. Pathan S. S , Prof. Dr. Hingane. L. D. Extraction and Characterization of rack heel cream from Aloe vera and bees wax 2022;

7. Anuradha, K., Unmesh, K., Ashwini, D., Dhurde, S.S., Veena, D. and Shrikhande, B.K., 2016. Formulation development and evaluation of cream containing natural essential oils having mosquito repellent property. *World J. Pharm. & Pharm. Sci*, *5*(8), pp.1586-93.

8. Patel, N.R., Momin, H.U., Dhumal, R.L. and Mohite, K.L., 2017. Preparaprepartion and evaluation of multipurpose herbal cream. *Adv. J Pharm Life sci. Res*, *5*(1), pp.27-32.

9. Dhase, A.S., Khadbadi, S.S. and Saboo, S.S., 2014. Formulation and evaluation of vanishing herbal cream of crude drugs. *Am J Ethnomed*, *1*, pp.313-8.

10. Lin, T.K., Zhong, L. and Santiago, J.L., 2017. Anti-inflammatory and skin barrier repair effects of topical application of some plant oils. *International journal of molecular sciences*, *19*(1), p.70.

11. Parker, J., Scharfbillig, R. and Jones, S., 2017. Moisturisers for the treatment of foot xerosis: a systematic review. *Journal of foot and ankle research*, *10*, pp.1-10.

12. Lodén, M., von Scheele, J. and Michelson, S., 2013. The influence of a humectant-rich mixture on normalz skin barrier function and on once-and twice-daily treatment of foot xerosis. A prospective, randomized, evaluator–blind, bilateral and untreated-control study. *Skin Research and Technology*, *19*(4), pp.438-445.

13. Baalham, P., Birch, I., Young, M. and Beale, C., 2011. Xerosis of the feet: a Title comparative two-deck study on the effectiveness of two moisturizers. *British Journal of Community Nursing*, *16*(12), pp.591-597.

14. Padmanabha, V.A., Sankar, J. and Malakar, J., 2017. Evaluation Of Foot Creams Formulation On Human Skin–A Novel Approach.

15. Dange, S.V. and Grandhi, S., 2009. Clinical efficacy of Foot Care Cream in the management of foot cracks. *Indian Medical Journal*, *103*(10), pp.350-353.

16. Viswanathan, V., Kesavan, R., Kavitha, K.V. and Kumpatla, S., 2011. A pilot study on the effects of a polyherbal formulation cream on diabetic foot ulcers. *The Indian journal of medical research*, *134*(2), p.168.

17. Polaskova J., Pavlackova J., Vltavska P., Janirkova G., Kasparkova V. and Janis R. The moisturize influence of the commercial cosmetics on the foot skin. *Advances in Environment, Biotechnology and Biomedicine,* 2012; 127: 272-277.

18. Manimaran, S., Loganathan, V., Akilandeswari, S., Jaswanth, A., Sathya, S. and Ruckmani, K., 2002. Wound healing and antimicrobial activity of formulated cream of leaf volatile oil of Atalantia monophylla Correa. *Hamdard Medicus (Pakistan)*, *45*(4).

19. Sumitra, M., Manikandan, P. and Suguna, L., 2005. Efficacy of Butea monosperma on dermal wound healing in rats. *The International Journal of Biochemistry & Cell Biology*, *37*(3), pp.566-573.

20. Datta, H.S., Mitra, S.K. and Patwardhan, B., 2011. Wound healing activity of topical application forms based on ayurveda. *Evidence-Based Complementary and Alternative Medicine*, *2011*.