JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Formulation And Evaluation Of Heel Fissure Cream Using Mustard oil.

Sanket Kailas Thorat, Sanjana Sharad Ugale, Prof. Ashwini Vishnu Tagad

Pharmacy

Ashvin College of Pharmacy,Manchi Hill

I. ABSTRACT:-

Feet are another important organ in the body that are used for movement, even though they are occasionally ignored (such as walking, running, and jumping). We have to pay attention to them. The main objective of our formulation was to use Aloe vera, turmeric and mustard oil as API to make an anti-crack cream with antibacterial and therapeutic qualities. To ascertain the effectiveness of the cream, a number of substances with anti-inflammatory properties were added, and microbiological studies were conducted. It was found that the developed solution was risk-free, effective, and efficient in treating cracked heels.

Objective:- Our research's primary goal was to create a cream and formulation that would treat cracked heels by using Mustard oil.

Method:- A mixture of mustard oil, bees wax, honey, and rose water was made into the cracked heel cream. The cream is examined for evaluation factors such irritancy, spreadability, stability, after feel, and washability, and the right amount of ingredients is utilized in the formulation for safety.

Result:- It was discovered that the created cream, which contained mustard oil, was pleasing, safe, and helpful in treating cracked heels.

Conclusion:- To protect skin and treat cracked heels, produced cracked heel cream with anti-inflammatory, analgesic, and moisturizing properties can be used without causing irritation.

Keywords:- : **Cracked Heel Cream, Mustard oil, Herbal Cream.**

II. INTRODUCTION:-

The market for cosmetic creams in India is expanding quickly due to celebrity television advertisements and quickly shifting lifestyles. The proactive Fast-Moving Consumer Goods

(FMCG) sector in India has grown significantly over the past 20 years, averaging 20% annual growth. Indians are seeing a paradigm change in the way they use household products—from ancient methods to modern ones involving branded cosmetics and cream types.

In addition, the skin of the plantar region differs structurally from skin on other body areas. Heel cracks are age-insensitive and can affect anyone, regardless of gender, race, or nationality. Cracks are typically occupational, such as in farming or among those whose work requires constant standing.

Common causes include advanced age, prolonged standing on hard floors, walking excessively on uneven surfaces, uncomfortable, ill-fitting, or open-backed shoes, an unhealthy diet, diabetes, obesity, psoriasis, and other skin allergies, unclean feet, and high exposure of the feet to dust, dirt, bacteria, etc. Females are more likely than males to have cracked heels as a result of conducting home chores carelessly, such as working in unclean areas while barefoot.

Individuals with cracked heels are seen in all socioeconomic strata, ranging from higher social classes. It also Recurs because of seasonal differences. The main prerequisite for both beauty and an appealing personality is having healthy skin. Any flaw or defect in skin beauty results in a significant disability or social stigma. It could make the person feel less confident.

Cracked heels are referred to as padadari in Ayurveda. These days, it's regarded as one of the main issues with both sexes' cosmetic health. It is most common in those who walk large distances on a regular basis and don't take good care of their feet. It immediately impacts a person's routine. Heel cracks indicate inadequate hydration or attention to foot care. In the medical field, heel fissures are another name for cracked heels. On the epidermis, fissures are regular linear cut wounds. Occasionally, it could penetrate far into the dermis and cause pain. The feet stretch sideways when the pads are subjected to excessive pressure. When the skin around the foot dries out, it cracks, leading to cracked heels.

For example, in-shoe devices can be utilized to change the forces acting on the stressed tissue; allergen removal or treatment for conditions like tinea pedis can lessen or eliminate the underlying cause. To aid in resolution, debridement of hyperkeratotic tissue and epidermal strength optimization are also critical.

Controlling the water content of the stratum corneum can be accomplished by moisturizing anhidrotic skin using an emollient or hydrocolloid dressing. However, there is anecdotal evidence that the mechanical forces associated with weight bearing make it difficult for dry heel fissures to heal. Once a painful fissure appears, standard therapies for hyperkeratosis are not very effective. Therefore, it is necessary to investigate the need for healing and, more importantly, for immediate and long-lasting pain alleviation by fissure closure.

Fissures are typically thought to appear in dry skin caused by autonomic neuropathy-related reduced sweating. Investigating the cut-off Point of skin hydration with fissure and variables was the aim of this study. connected to patients' poor skin moisture levels. It is anticipated that our research will help people with foot fissures receive preventive therapy. Heel fissure conditions can cause pain and discomfort, making them ugly and ultimately worsening the affected person's quality of life. The foot is susceptible to ulceration, infection, and amputation in elderly patients and those with diabetes who have additional peripheral vascular

disease problems. Callus can impair balance in the elderly population, which raises their risk of falling.

III. MATERIAL AND METHOD:-

3.1. Raw Materials:-

3.1.1. Bees wax:-

Beeswax is a naturally occurring product secreted from worker bees that has varied uses in modern day. In skincare, its function ranges from its role as an occlusive, helping to create a semi-occlusive skin barrier that minimizes transepidermal water loss; as a humectant, locking in hydration; and an emollient to soften and soothe the skin. As a natural substance, its use has been shown to help alleviate symptoms associated with common cutaneous conditions like dermatitis, psoriasis, and overgrowth of normal skin flora.

3.1.2. Mustard oil:-

The qualities of mustard oil include antimicrobial, antifungal, analgesic, and antibacterial effects.

This aids in lowering pain and inflammation as well as preventing microbial growth, preventing fungal infections, and combating bacterial infections. Additional qualities or advantages include toning as well as promoting perspiration, enhancing hunger, preventing phlegm, and improving circulation. Due to its high magnesium and selenium content, mustard oil has anti-inflammatory qualities. In addition to omega-3 fatty acids and alpha-linolenic acid, mustard oil contains multiple vitamins, including A, B complex, and E. These components support proper hydration and guard against the harm that free radicals can do, which can ultimately result in early aging. Additionally, mustard oil promotes the formation of collagen.

3.1.3. Coconut oil:-

Coconut oil helps to hydrate skin and reinforce its natural defensive barrier to better retain moisture which means coconut oil for dry skin is fantastic. The anti-inflammatory properties that coconut oil has means it has the ability to help treat acne, which is an inflammatory condition.

3.1.4. Aloe Vera gel:-

The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids. the Aloe vera plant has been used for various purposes in dermatology. Used as a Healing properties, Effects on skin exposure to UV and gamma radiation, Anti-inflammatory, Antiseptic etc.

3.1.5. Rose water:-

Cream contains rose water to add fragrance and odour. Its scent has antidepressant and stress-relieving properties. used most frequently for mental health. It has vitamins, vegetable oils, and extracts to nourish and soften the skin. It stops the heels from breaking and increases blood flow.

Rose water has antiviral, antispasmodic, antidepressant, and antimicrobial qualities. It is also used in aromatherapy and is an astringent and cleaning agent. Rose water is renowned for its capacity to combat microorganisms that cause acne. It reduces acne flare-ups.

3.1.6. Turmeric powder:-

From many years awareness of turmeric and its use as medicine is continuously increasing. A flowering plant, Turmeric, in the ginger family, is commonly used as a food colouring and is one of the basic ingredients in curry powder. To heal many health disorders like liver problems, digestive disorders, treatment for skin diseases and wound healing turmeric has long been used in Medicinal as an anti-inflammatory. Curcumin is the active ingredient in turmeric which has been shown to have a wide range of therapeutic effects.

3.1.7. Borax:-

Borax (also referred to as sodium borate tincar) is a salt (ionic compound),chemical a hydrated or anhydrous borate of sodium with the chemical formula Na2H20B4O17. It is a colourless crystalline solid, that dissolves in water to make a basic solution.

3.1.8. Honey:-

The common ingredients of a moisturizer include emollients, humectants and other ingredients. Past research found out that honey can be used as a moisturizer for the skin. The ability of honey to act as a moisturizer comes from its natural humectant properties Though, the exact mechanism is unknown, it is believed that the humectant property is contributed by the high content of glucose and fructose in honey. Both fructose and glucose can form hydrogen bridges with water, retaining the moisture in the horny skin layer thus providing a hydrating effect to the skin.

3.1.9. Liquid paraffin:-

Paraffin also known as paraffinumliquidum, paraffin oil, liquid paraffin oil or Russian mineral oil, is a very highly refined mineral oil used in cosmetic and medicine Cosmetic or medicinal liquid paraffin should not be confused with the paraffin (i.e. kerosene) used as a fuel. The generic sense of paraffin meaning alkane led clique to regional differences for the meanings of both paraffin and paraffin oil.

IV. FORMULATION AND PROCEDURE OF CREAM:-

Table 1:- Compositions of Cream.

Sr. No.	Ingredient	Formula	Role
1.	Bees wax	**10.0 gm**	Antiseptic, anti-Inflammatory
2.	Mustard oil	**1.0 ml**	Pain Reducer ,Enhance skin health, Preservative.

3.	Coconut oil	**1.0 ml**	Bost skin health, Antimicrobial
4.	Alvera gel	**6.0 ml**	Antiseptic, Anti-bacterial.
5.	Rose water	**q.s.**	Aromatic Agent
6.	Turmeric Powder	**0.2 gm**	Wound healing activity, natural colourant
7.	Borax	**0.5 gm**	Emulsifier
8.	Honey	**1.0 ml**	Humectant
9.	Liquid paraffin	**10.3 ml**	Emollient
10.	Distilled Water	**10.0 ml**	Vehicle

PROCEDURE:-

Part 1:-

Collect all the herbs, weight accurately the 10 gm Bees wax , add 10.3ml of liquid paraffin , add the 1 ml Mustard oil, and 1 ml Coconut oil and in beaker then heat at 70 degree .

Part 2:-

Weigh the 0.5 gm Borax accurately. Then addition of 10 ml of Water in beaker. Then slowly addition of 6 ml Alvera gel and 1 ml of Honey mix well, then heat at 70.

Part 3:- Addition of all contain

Mix the 2nd beaker contain into 1st beaker and then stirred constantly and Add q.s of Rose water, 0.2 mg of turmeric powder mixture into this .

Figure :-Prepared Heel Fissures cream Formulation.

V. EVALUATION OF CREAM:-

5.1. Physical characteristics

We looked at the cream's colour, smell, and appearance.

5.2. Washable

After applying the cream, the hand was checked under running water.

5.3. The Cream's pH

A digital PH meter was used to measure the prepared cream's PH. The cream solution was made by Using 100 millilitres of purified water, leave it for two hours. PH values were obtained for the solution and A mean value was computed.

5.4. Uniformity

Tests of homogeneity were conducted using touch and appearance.

5.6. Visual Appeal

The colour, pearlescence, and roughness of the cream were used to score its appearance.

5.7. After feel

After applying a set quantity of cream, the residue left behind, its emolliency, and its slipperiness were verified.

5.8.Type of Smear

Following cream application, the kind of film or smear that developed on the skin was examined.

5.9. Test of Dye

The cream is combined with the Sudan III dye. A drop of the cream is applied to a tiny slide, which is then covered with a cover slip and examined under a microscope. Should the scattered globules seem crimson, the ground will be colourless. The Cream is of the o/w kind. The opposite circumstance occurs in cream of the w/o type, meaning that the scattered globules seem colourless. on the crimson earth.

5.10. Test of Spreadability

The cream sample can be sandwiched between the two glass slides and compacted to a consistent thickness by adding weight to the weighing pan after the 100 gm of weight has been there for five minutes.

Spredability can be measured by timing how long the upper glass slide moved over the bottom slide.

Ability to spread= m * l/t

T = time taken,

L = length moved on the glass slide

M = weight tight to top slide.

5.10. Anger Assessment

After the lotion was administered, the time was recorded on the cracked heel skin. Erythema, edema, and irritability were assessed.

if any, for as long as 24 hours at regular intervals and reported.

5.11. Stability Test

Cream was examined for 14 days while it was kept at room temperature.

VI. RESULT AND DISCUSSION:-

6.1. Physical properties

The physical properties of formulated cream were judged by colour, odour and texture.

Table 2 : Evaluation of physical properties.

Sr.No.	Parameter	Evaluation.
1.	Colour	Yellow
2.	Odour	Pleasant
3.	Texture	Smooth

6.2. Washable

The cream applied on skin was easily removed by washing with tap water.

6.3. The Cream's pH

The pH of the cream is **7** good for the skin, because the skin pH is 7.4.

6.4. Dye Examination

The cream is combined with the Sudan III dye. Put a small amount of the cream onto a tiny slide. Puts a lid on it cover slip, and uses a microscope to study it. In the red ground, the scattered globules appear colourless. such as w/o type cream.

6.5. Uniformity

Tests of homogeneity were conducted using touch and appearance. The cream shows excellent uniformity

6.6. Visual Appeal

After a prolonged storage period, it was discovered that the colour and smoothness remained unchanged.

6.7. After Feel

Emolliency, slipperiness, and residual amount upon application of a set quantity of cream were determined to be Good after feel.

6.8. Type Of Smear

Non-greasy smears developed on the skin following the application of cream base. Nevertheless it appears greasy.

6.9. Test of Spreadability

The cream formulations should have spreadabilities in 2.5 cm for 5 min. (cm/s). The spreadability test was conducted on the palm and dorsal surfaces of the hand. The good spreadability was discovered.

6.10: Anger Assessment In this experiment, cream was applied on a cracked heel's skin to see how it affected the skin. was contrasted with the commercial product. There was no edema or irritation discovered.

6.11 Stability Test

Cream were monitored for 14 days at room temperature, the cream's outcome remained consistent for 14 days. No pollution or microbial development either. its Stable.

Table 3:-Result of Evaluation Parameter.

Sr. No.	Parameters	Evaluation
1.	Physical properties	Satisfactory
2.	Washable	Washable
3.	PH	7
4.	Dye Test	W/O Type Cream
5.	Uniformity	Excellent
6.	Visual Appeal	No changes
7.	After Feel	Good
8.	Type Of Smear	Greasy
9.	Spredability	Good
10.	Anger Assessment	Non-irritant
11.	Stability	Stable

Our primary goal was to create a cream formulation using ingredients including mustard oil, Bees wax, aloe vera , honey, turmeric and rose water that would be used to heal cracked heels. Consistency and agitation Research was done to determine the cream's safety for patient compliance.

It was discovered that mustard oil is a secure and efficient remedy for cracked heels. Herbal creams with anti-inflammatory, analgesic, antifungal, antimicrobial, and antibacterial properties that don't cause side effects can be used to lesser pain and prevent infections. Additionally employed as a barrier to soften, moisturize, and protect the skin of the feet. Formulations for crack cream were prepared and tested for safety and efficacy. The results is described the cream is Effective.

Sr. No.	Parameters	Evaluation
1.	Physical properties	Satisfactory
2.	Washable	Washable
3.	PH	7
4.	Dye Test	W/O Type Cream
5.	Uniformity	Excellent
6.	Visual Appeal	No changes
7.	After Feel	Good
8.	Type Of Smear	Greasy
9.	Spredability	Good
10.	Anger Assessment	Non-irritant
11.	Stability	Stable

VII. CONCLUSION

We prepared the heel fissures cream with the intention of treating and preventing cracked heels. Heel fissures are known to induce bacterial, fungal, and other illnesses. Patients with that kind of infection linked to cracked or fissured heels can benefit from this cream. The ingredients of this cream include mustard oil. Functions of mustard oil include antibacterial, analgesic, antimicrobial, and antifungal properties. This aids in lowering pain and inflammation as well as preventing microbial growth, preventing fungal infections, and combating bacterial infections. The ingredients we utilized to make the cracked heel cream, also known as heel fissure cream, are listed in table 1. For the greatest results, we utilized the materials listed above in the proper amounts.

We conducted tests on cream using the guidelines listed in Table 3. And the outcomes of their review are pleasing. We evaluated the cream based on several factors,

including spreadability, irritancy, after feel, and stability. This produces the favourable outcomes. the cream formulation demonstrated good homogeneity, consistency, and spreadability, as well as no irritation or change in appearance throughout the research period. The mentioned study leads to the conclusion that using Heel fissure cream is safe. An herbal cream which is non-toxic, effective And improves patient compliance by the utilization of herbal extracts would be highly acceptable than others.

VIII. ACKOWLEDGEMENT:-

We are highly thankful to Miss. Ashwini V. Tagad Mam ,Assistant Professor of Ashvin college of pharmacy (Guide Teacher), Ashvin College Of Pharmacy, Manchi, Hill. for their Support and encourage to us and for providing Such a good guidance.

REFERENCE:-

1. Nirmala Gupta1, Aditi Dubey, Pushpa Prasad, Amit Roy Formulation and Evaluation of Herbal Fairness Cream Comprising Hydroalcoholic Extracts of Pleurotus ostreatus, Glycyrrhiza glabra and Camellia sinensis. UK Journal of Pharmaceutical and Biosciences Vol. 3(3), 40-45, 2015. Pharmaceutical and Biosciences Journal · June 2015.
2. Sanika P. Mukkirwar, Srushti S. Mukkirwar, Vibhavari M. Chatur and Sanjay G. Walode. Development and evaluation of herbal foot crack gel. World Journal of Pharmaceutical Research Volume 11, Issue 2, 1558-1565. Research Article ISSN 2277– 7105.
3. N. M. Saptarini1, and G. Hadisoebroto formulation and evaluation of lotion and Cream of nanosized chitosan-mangosteen (Garcinia Mangostana L.) pericarp extract Rasayan J. Chem., 13(2), 789-795(2020) Vol. 13, No. 2 ,789 – 795, April – June 2020. ISSN: 0974-1496.
4. Belinda Longhurst, private practitioner, Winchester, Hants, Elisabeth Allan, private practitioner, Hants & Ivan Bristow, lecturer, University of Southampton The treatment of dry heel Fissures using cyanoacrylate Tissue adhesive (glue): A review of 18 cases. Podiatry Now September 2010.
5. Chauhan Lalita, Gupta Shalini Creams: A Review on Classification, Preparation Methods, Evaluation and its Applications. Journal of Drug Delivery & Therapeutics. 2020; 10(5-s):281-289. ISSN: 2250-1177.
6. Makoto Oe, Kimie Takehara, Hiroshi Noguchi, Yumiko Ohashi, Mayu Fukuda, Takashi Kadowaki, Hiromi Sanada, Skin hydration of the heel with fissure in Patients with diabetes: a cross-sectional Observational study. Chronic Wound Care Management and Research 2018:5.
7. Longhurst B, Steele C. Dry heel fissures: treatment and prevention. Dermatological Nursing 2016, 15(3): 46-49.
8. Virendra v. patil,Yogesh S. Thorat, Nagesh S. Kote, Avinash H. Hosmani, formulation and evaluation of crack cream from plant extracts. International Journal of Current Pharmaceutical Research. ISSN- 0975- 7066. Vol 12, Issue 3, 2020.
9. Avish D. Maru, Swaroop R. Lahoti, formulation And Evaluation Of Moisturizing Cream Containing Sunflower Wax, International Journal of Pharmacy and Pharmaceutical Sciences. ISSN- 0975-1491. Vol 10, Issue 11, 2018.

10. Nikhil Nitin Navindgikar, K. A. Kamalapurkar, Prashant S. Chavan, Formulation And Evaluation Of Multipurpose Herbal Cream, International Journal of Current Pharmaceutical Research. ISSN- 0975-7066. Vol 12, Issue 3, 2020.

11. Tejswini Devidas Navgire, Madhuri Baburao Pawar, Formulation And Evaluation Of Cold Cream, International Journal of Creative Research Thoughts (IJCRT)Volume 9, Issue 9 September 2021. ISSN: 2320-2882.

12. Vaishnavi S. Patil, Sayali M. Yadav, Nisha S. Zende, Manisha M. Murgude, Rohan R. Vakhariya, Dr. C. S. Magdum, Formulation and Evaluation of Poly Herbal under Eye Cream, International Journal of Creative Research Thoughts (IJCRT), Volume 10, Issue 1 January 2022. ISSN: 2320-2882.

13. Mr. Pathan Shabajsohil, Prof. Dr. Hingane .L.D, Formation and characterization of crack heel cream From Aloe vera and bees wax, International Journal for Research Trends and Innovation, Volume 7, Issue 6, ISSN: 2456-3315.

14. Puja Haridas Wadekar, Vaishali Potnis, A Review on Heel Fissures and its Management, International Journal of Research in Engineering, Science and Management, Volume 4, Issue 2, February 2021. ISSN (Online): 2581-5792.

15. Naveed Akhtar, Shahiq-uz-zaman, Barkat Ali Khan, Evaluation of various functional skin parameters using A topical cream of Calendula officinalis extract, African Journal of Pharmacy and Pharmacology · February 2011.

16. Nishigandha Jagtap, Nilima Wadnerwar, Pharmaceutical evaluation of Snuhi ksheera siddha taila and a Pilot study on its efficacy in Padavidarika (cracks on heel). International Journal of Ayurvedic Medicine, Vol 12 (2), 236-242.

17. Stylecraze.com/articles/simple-home-remedies-for-crackesheels/#gref. [Last accessed on 10 Dec 2019].

18. Mithal BM, Saha RN, A Handbook of cosmetics, Vallabh prakashan, 2006 (89).

19. Shah RN, Methal BM, A Hand book of Cosmetics Page No.1

20. C.K. Kokate, S.B. Gokhale , Pharmacognosy.

21. En.wikipedia.org/wiki/cream_(pharmacy)

22. R. P. Yadav, Bibha Kumari, Ultrasonic Studies on Mustard Oil: A Critical Review, International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 (2013).

23. Sayantani Dasgupta and Dipak Kumar Bhattacharyya, Dietary Effect of g-Linolenic Acid on the Lipid Profile of Rat Fed Erucic Acid Rich Oil, Accepted August 7, 2007 (received for review May 28, 2007), Journal of Oleo Science ISSN 1345-8957 print / ISSN 1347-3352 online http://jos.jstage.jst.go.jp/en/.

24. Hazrina Hadi,Syarifah Shakira Syed Omar,Ammar lhasan Awadh ,Honey, a Gift from Nature to Health and beauty,A Review.

25. Debjit Bhowmik, Chiranjib,K.P.Sampath Kumar,Murgret Chandira,B.Jayakar,ISSN 0975-508X,2009.

26. Arjun Yadav, Girijesh Kumar Yadav, Shashikant Maurya, A Review Article ON Formulations and evaluation of Cold cream, ISSN:2249-7781, Volume 8 Issue 3, 2023.