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HERBAL FOOT CREAM FORMULATION OF FICUS RACEMOSA LEAVES EXTRACT

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ABSTRACT

Background: Due to the lack of oil glands and reliance on hundreds of thousands of sweat glands to maintain moisture, the skin on our feet is drier than the skin on the rest of the body. As a result, feet require specific care for protection, aesthetics, and comfort. Dry and cracked feet can be brought on by a lack of moisturizing, excessive exposure to pollutants. One such ancient therapeutic plant is F. Racemosa, which is widely found in India and throughout the world to treat diseases. Herbal extract of F. Racemosa leaves has found to be effective in treating cracked feet. **Methodology:** Extract of Ficus Racemosa leaves was used in the formulation of foot cream. Three formulation were prepared using these extract and variable amount of extract was used in each formulation from 1 to 3 %. Among them the formulation which has the most healing property was further evaluated.The purpose of this study is to investigate the cosmetic values of skin healing and moisturizing characteristics of Ficus Racemosa. **Result:** The formulation F3 shows the better result among others. Hence the herbal foot cream formulation containing 3% of Ficus Racemosa leave extract shows the good healing properties. **Conclusion:** The herbal formulation helps to restore foot skin moisture without causing any harmful effect. Ficus Racemosa leave extract can be further used to formulate for formulation to rejuvenate skin.

KEYWORDS: Ficus Racemosa, Foot cream, Moisturizer, phytochemical evalution.

INTRODUCTION

One of the most frequent problems ladies have is cracked and dry heels. Applying a foot cream every day might assist in avoiding cracked heels and dry feet in general. The organs that support the entire weight of body are feet. Especially the heel area in feet starts to harden due to carrying all the load and loss of skin moisture. This hardness eventually causes chapping in the heel area. If no measure is taken, chapping deepens and causes big scars. To prevent all these, foot care creams with heel softening features should be used and it should be ensured that the lost moisture is regained.[1]

Diabetes, gout, and arthritis are three examples of systemic foot disorders that are common in older adults. Herbal medications are in greater demand because of their powerful pharmacological activity and cost-effectiveness. Extensive study is required to standardize and confirm ayurvedic medicines for their potency, safety, and efficacy.[2,3] Ficus Racemosa Roxb, also known as Gular, Gular fig, Cluster fig, or Country fig, is a plant that grows all throughout India and belongs to the Moraceae family. Racemosic acid, tetraterpene, triterpenoids (Which are essentially lanosterol), alkaloids, gluanol acetate, flavonoids, and tannins are claimed to be present in the leaves. The leaves also have anti-tussive, antioxidant, wound-healing, antibacterial, antifungal, and hypoglycemic qualities in addition to their ability to rejuvenate the skin.[4] However, there hasn't been much work done so far to assess the cosmetically significant features. The leaf buds have excellent anti-infection properties. For sores and ulcers, a leaf decoction is used and it is applied as a douche to treat dysmenorrhea.[5] This is commonly found in Australia, Malaysia, Southeast Asia and the Indian subcontinent. It is cultivated all over India and countries near to it .It naturally grows in numerous hills and woodlands. It occurs frequently in South India and is widely distributed in the outer Himalayan ranges, Punjab, Khasia Mountain, Chota Nagpur, Bihar, Orissa, West Bengal, Rajasthan, and Deccan.[6,7] The current work focuses on an effort to create and assess a foot cream that contains an extract from Ficus recemosa that has moisturizing and wound-healing properties, which is extremely stable, and produces good outcomes.

MATERIAL AND METHOD

Collection of plant material: In the month of March, leaves from the tree were gathered from locations around Pathardi Phata Local Region in Nashik and authenticated in college laboratory.

Preparation of plant extract: The leaves were collected and cleaned with cold water before being air dried for two weeks. The electrical mixer was used to reduce the size.

A 100 gm portion of the powder was used in 15 cycles of Soxhlet Apparatus using ethanol (500 ml) as the solvent over the course of three days. The filtrate was collected, and then it was isolated to produce solid extract.

Isolation and Drying of plant extract: The solution is then concentrated using rotatory evaporator and then on hot plate, further air dried.

Preparation of foot cream

Base formulation without herbal extract was prepared consisting of cocoa butter and magnesium sulphate to obtain the basic formula for cream preparation. The cream obtain with a very light-textured cream that has the ideal amount of moisturizing, healing and emollients to soften the foot.[8]

Table 1: Composition of foot cream.

No.	Ingredients	F1 (%)	F2 (%)	F3 (%)	Use of Ingredients
1.	Leaves	1	2	3	Has a healing & moisturizing property.
2.	Glyserin	7	6	7	Acts as humectants.
3.	Vitamin E	1	1	1	Acts as preservative.
4.	Cocoa butter	5	4	4	Soften cracked heel.
5.	Disodium EDTA	4	4	3	Act as preservative.
6.	Fragrance	3	2	3	-
7.	Cetyl Alcohol	1	2	1	Act as emollient.
8.	Water (Aqua)	20	23	22	Act as solvent.
9.	Urea	3	2	2	Antibacterial & Anti-inflammatry, strongest exfoliating action.
10.	Magnesium Sulphate	4	4	4	Soothing skin, Relive pain.
11.	Tragacanth	3	2	1	Emulsifier.
12.	Rose oil	1	1	1	Fragrance.
13.	Colours	1	1	1	-

Ingredients for the oil phase were weighed & heated in 250ml borosilicate beaker at medium temp until uniform liquid form. Aqueous phase was prepared by dissolving weighted ingredients in water at a low flame with constant stirring to produce a continuous Phase. Three distinct concentration of the water phase are combined with the oil phase's contents. Triturating the formulation at 35°C added 1%, 2%, and 3% of the total F. Racemosa extract until the constituents were evenly distributed. The manufactured creams were packaged and stored in airtight plastic containers while the formulation was allowed to equilibrium for 12 hours at room temperature.[8]

Phytochemical evaluation of leave extract[9]

The following constituents were phytochemically examined in the obtained extract.

Test for alkaloid: 2 ml of HCI and The extract, 5 ml were combined. 1 ml of Dragendroff's reagent was added to this acidic medium. Alkaloids were present as soon as a red or an orange precipitate was generated.

Test for amino acids: A few drops of the Ninhydrin reagent were added to 1 ml extract. The absence of amino acids was shown by the absence of purple appearance.

Test for anthraquinones: Adding 2ml of the plant extract with 2ml of 2N HCL. The appearance of pink red color that turns purplish blue after addition of ammonia indicates the presence of Anthraquinones.

Test for flavonoids: A few drops of diluted sodium hydroxide were added to 1 ml of the extract. The plant extract created a strong yellow colour that turned colourless when a few drops of diluted acid were added, indicating the presence of flavonoids.

Test for glycosides: The extract was hydrolyzed with HCl on a water bath for a few hours. The hydrolysate, please. A millilitre of pyridine, a few drops of sodium nitroprusside solution, and sodium hydroxide solution were all added before it was rendered alkaline. The presence of glycosides was shown by the colour change from pink to red.

Test for saponins: The extract was diluted with 20 cc of distilled water and then agitated for 15 minutes in a graduated cylinder. The appearance of saponins was indicated by the creation of a 1 cm layer of foam.

Test for steroids: A test tube was filled with 10 ml of chloroform, 1 ml of the extracts, and an equivalent proportion of strong sulphuric acid. The sulphuric acid layer appeared yellow with green fluorescence while the upper layer turned red. This suggested that steroids were present. [8]

Test for tannins: A few drops of 1% lead acetate were added along with 5 ml of the extract. When a yellow precipitate formed, tannins were present.

Test for triterpenoids: After dissolving 5 ml of the extract and a few drops of 1% lead acetate were added and adding 2 ml of concentrated sulfuric acid. Triterpenoids are present when reddish violet color develops.

Evaluation of foot cream

Physical parameter

Color: A visual inspection was used to determine the cream's colour. The checks were made with a white backdrop.[10]

Odor: The created cream's odour was evaluated by smell.

Consistency: By applying to skin, the consistency was evaluated.[11]

Greasiness: The greasiness was evaluated by applying it to the skin.[12]

pH determination: A 5g portion of cream, precisely weighed, was added to a 100ml beaker. The cream was mixed with 45ml of water after being added. At 27^0C, the pH was measured using a pH metre.

Homogeneity: Visual inspection was used to check the homogeneity of developed cream. They were their look and any aggregates were present.[13]

Water Wash ability: The formulations were applied to the skin, and manual inspections were made of the ease and scope of water washing.[14]

Case studies

From the above observation, it was decided to use cream containing 3% concentration of F. Racemosa leaves extract for subjective evaluation.

Materials and Method: 1 subjects of sex female, from the age group of 30-60years, who were having symptoms like the hard, dry and flaky cracking of the skin of the heels, and were willing to give informed consent were enrolled in the study. Subjects who were willing to participate in the study were given detailed description about the research product, nature and duration of the study.

METHODOLOGY[1,15]

The subjects were instructed to use the product as directed for seven days, applying it each day.

1. Until the first fingermark, about 2 gm of the cream was applied.
2. The entire area of the foot where dryness was the worst was covered. It was gently massaged into the soles of the feet in a circular motion.
3. The individuals were instructed to apply the cream every day for a week, wear socks for at least two hours each day, and record any changes that occurred before and after using the foot cream.

At admission and after seven days, individuals underwent follow-up and assessment. Cracks in heels, dryness of soles, and soothing and moisturizing effects were among the assessment criteria.-

Condition of the skin-Cracks in heels

0: No cracks,
1: Dry soles with one or two cracks
2: 5-7 cracks,
3: Many superficial cracks
4: Slight deep cracks,
5: Deep cracks with severe pain and bleeding which causes difficulty in walking.

Dryness of sole

0: No dryness,
1: Slight dryness,
2: Dryness only at the cracks,
3: Dryness over the entire sole

Soothing and Moisturizing effect

1: No change,
2: Fair,
3: Good,
4: Very good.
5: Excellent.

Appearance

1: Poor performance
2: fair
3: good
4: very good
5: excellent

Spread-ability

1: Poor performance
2: fair
3: good
4: very good
5: excellent

- Following 7 days, the individuals' responses to questions about allergies or other undesirable symptoms were gathered. All negative incidents that subjects reported or saw were documented.

RESULT

The extract obtained was evaluated for phytochemical. Table 2 shows the presence of some phytoconstituent in leave extract.

Table 2: Phytochemical test result of F. Racemosa leaves extract.

Phytochemicals	Inference
Alkaloids	+
Amino acids	-
Anthraquinones	-
Flavonoids	+
Glycosides	-
Saponins	-
Steroids	-
Tannins	+
Triterpenoids	-

The sign + indicate constituent present in extract and – indicate the absence of constituent in extract.

Evaluation of foot cream

Some parameters were evaluated by physical appearance of cream.

Table 3: Physical parameters of skin healing foot cream.

Sr. No.	Physical parameters	F1	F2	F3
1	Colour	Yellow	Yellow	Yellow
2	Odour	Characteristics	Characteristics	Characteristics
3	Consistency	+	++	+++
4	Homogeneity	-	+	+
5	Gresiness	+	-	-
6	Water wash ability	-	+	+
7	pH	6.1	5.8	5.5

Consistency: Excellent (+++), Good (++), Satisfactory (+)
Homogeneity: Homogeneous (+)
Greasiness: Non greasy (-), Greasy (+)
Water wash ability: Washable (+)

Case study

Formulation 3 was evaluated for healing properties on cracked skin on female subject for seven days.

Table no 4: Subjective evaluation of foot cream with 3% F. Racemosa extract.

Subject				At Entry	7 days					
No.	Sex	Age	Skin type	Conditions On feet	Dryness Of sole	Healing property	Moisturizing	Appearance	Spreadability	Irritance
1	F	40	Dry	4	2	2	3	5	3	None

Before **After 7 Days**

Figure 1: Subjective evaluation of Foot cream.

According to the findings of the evaluation, foot cream containing 3% F. Racemosa extract offers the essential healing properties for cracked skin.

DISCUSSION

Soxhlet extraction process was carried out to extract the active constituent of Ficus Racemosa leaves. The leaves extract was further evaluated for phytochemical analysis

and healing property. Different phytochemical test were performed and presence of alkaloids, flavonoids and tannins was confirmed. Formulation was done by varying the concentration of leaves extract, quantity of glycerine, disodium EDTA as F1, F2, F3. The final formulation was checked for physical parameters like color, odour, consistency, greasiness etc. All formulation possess good constituency and spread ability. The formulation 1 is have greasiness and other are non-greasy. The anti-cracking and healing property was studied and the formulation with 3% Ficus Racemosa extract. It shows the greatest impact on reduction of crack size and possess good emollient property. It also has moisturising effect.

CONCLUSION

An effort has been made to create herbal foot cream compositions in the current study activity. The extraction was done using ethanol for Ficus Racemosa leaves. With foot therapy, a statistically significant positive effect was seen in the parameters of cracked heels, dry soles, and moisturising effect. Regarding colour, smell, and consistency, foot cream was acceptable for all formulation. The product's healing and moisturizing qualities produced good results. The most activity was seen with Formulation F3 with excellent crack heal properties. Extract from F. Racemosa leaves also has anti-cracking and healing properties; as a result, it can be used in skin creams to test their anti-aging effects.

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Authorship statement

PVB and MMK has done research under the guidance of DRM. DRM has analysed the result and drafted a manuscript. SVA and DRM has revised and finalize the manuscript.

Conflict of interest statement

The authors declared no conflict of interest.

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