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Research Article

# FORMULATION AND EVALUATION OF FOOT CREAM FROM *FICUS RACEMOSA*

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**ABSTRACT**

Feet are our body's substructure, so keeping them healthy is indispensable to our overall health. From ancient time variety of herbs have been used to treat different foot diseases. In this study, the main aim is the preparation of foot cream using *Ficus racemosa (cluster fig)* plant extract. Its biological active ingredients, such as Gluconal acetate, β-sitosterol, lupeol and lupeol acetate produces wound healing, antioxidant, anti-inflammatory, and anti-fungal activity over skin surface. The main objective of this research work includes the complete qualification of wound healing or screening, and it is useful to obtain good foot cream for topical application. Preparation of foot cream using *Ficus racemosa* was done and its evaluation was carried out on various parameters. The used product is compatible with other ingredients present in the formulation.

**Keywords:** *Ficus racemosa*, Foot cream, Wound healing, Anti-inflammatory, Cluster fig

## INTRODUCTION

Feet are an important organ of the human body and are exposed to high friction and the external environment. The lack of a sebaceous gland on foot predisposes it to dry skin. Negligence of the feet can lead to various disorders generally due to improper footwear, and one can suffer from infections because of external penetration of dirt, fungi, and bacteria through these cuts and wounds. Plants and their extracts have enormous potential for healing and healing wounds[1].

**Figure 1: Schematic Representation of Foot**

*Ficus racemosa* Linn has been widely used in traditional medicine for a wide variety of ailments. Its bark, fruit, leaves, roots, latex and seeds are used medicinally in various forms, sometimes in combination with other herbs[2].

***Ficus racemosa***
*Taxonomical classification*
*Kingdom: Plantae*
*Angiosperms: Flowering plant*
*Eudicots: More than two seeds*
*Order: Rosales*
*Family: Moraceae*
*Genus: Ficus*
*Species: F. racemosa*
*Binomial name: Ficus racemosa L.*
*Synonyms: Ficus glomerata*

**Figure 2: *Ficus racemosa* Plant representation**

A complete detail of the phytochemical and pharmacological properties is given in Table 1[3].

**Table 1: Chemical Constituents of *Ficus racemosa***

| | | |
|---|---|---|
| Leaves | ▪ Tetra triterpene<br>▪ Gluconal acetate<br>▪ A glucoside, racemosic acid<br>▪ Alkaloids<br>▪ Glycosides<br>▪ Flavonoids<br>▪ Phenolic compound<br>▪ Tannins | These have been reported to show anti-fungal, anti-bacterial, anti-inflammatory and wound healing properties |

## MATERIALS AND METHODS

**Collection of Plant Material:** Stems and leaves of the tree were collected from in and around the areas of Mirjan, Kumta in the month of August 2021.

**Figure 3: Dried Leaf of *Ficus racemosa***

**Preparation of Plant Extract:** Collected stems and leaves of plants were washed properly with cold water and were shade dried for one month. With the help of electrical grinder, the size reduction process was mainly done, and powder is passed through the sieve no 10µ to get uniform size. About 30gm of powder was taken in conical iodine flask with stopper cork and performing maceration process along with ethanol: water (70:30) as a solvent for about two days. Filter it to collect the filtrate. After collecting filtrate, it was distilled to get the water extract (*Ficus racemosa* extract)[4].

### Preparation of foot cream using *Ficus racemosa*

**Selection of Foot Cream Base:** In this foot cream preparation, the selected base is stearic acid and triethanolamine, which forms triethanolamine stearate, acts as a base and gives a very light textured cream containing a suitable emollient which softens the foot.

### Procedure for preparation of foot cream

**Followings are the steps followed for formulating the foot cream**

**Step-1: Preparation of oil phase**: The oil phase ingredients such as Stearic acid, Beeswax, Cetyl alcohol, Mineral oil were weighed and heated in the 250ml borosilicate beaker at the temperature of 70ºC to form a uniform liquid.

**Step-2: Preparation of water phase**: The water phase ingredients such as TEA, Methyl paraben, Propyl paraben, Glycerin, PEG-200, Distilled water and Ficus racemosa extract were weighed and heated with continuous stirring in the 250ml borosilicate beaker at the temperature 70ºC to form a uniform liquid. Above 70ºC, deterioration of ingredients takes place. Hence maintenance of 70ºC is important aspect during cream preparation.

**Step-3:** The content of the oil phase was mixed in the water phase. The four different concentrations such as 1%,2%,3% and 3.5% of the total extract of *F. racemosa* are added in the cream formulation at 35ºC during the triturating till the uniform dispersion of the ingredients is achieved. Formulation was allowed to equilibrate for 24 hours at room temperature, and the prepared cream was filled and stored in the airtight glass container

### Interpretation of the results

The following values are valid for healthy skin and normal room conditions (25ºC and 40-60%RH) and will help determine the skin type. Arbitrary units varied between 0 and 130, and the standard values are provided below.

**Table 2: Standard results**

| Arbitrary Units | Skin Type |
|---|---|
| Less than 30 | Very dry skin |
| 30-40 | Dry skin |
| >45 | Sufficiently moisturized |

### Formulation

**Table 3: Composition of *Ficus racemosa* foot cream**

| SN | Ingredients | Base | | $F_1$(%) | $F_2$(%) | $F_3$(%) | $F_4$(%) | Use of Ingredients |
|---|---|---|---|---|---|---|---|---|
| | | $F_{b1}$ | $F_{b2}$ | | | | | |
| 1 | Stearic acid | 2gm | 2gm | 2gm | 2gm | 2gm | 2gm | Forms cream base with TEA. |
| 2 | Cetyl alcohol | 0.2gm | 0.2gm | 0.2gm | 0.2gm | 0.2gm | 0.2gm | Acts as emollient. |
| 3 | Beeswax | 0.4gm | 0.4gm | 0.4gm | 0.4gm | 0.4gm | 0.4gm | Used as oil phase solvent. |
| 4 | Isopropyl myristate | 0.4gm | 0.4gm | 0.4gm | 0.4gm | 0.4gm | 0.4gm | Good absorption material. |
| 5 | Mineral oil | 1ml | 1ml | 1ml | 1ml | 1ml | 1ml | Gives consistency. |
| 6 | Propylparaben | 0.04gm | 0.04gm | 0.04gm | 0.04gm | 0.04gm | 0.04gm | Preservative for oil phase. |
| 7 | Triethanolamine (TEA) | 0.28ml | 0.28ml | 0.28ml | 0.28ml | 0.28ml | 0.28ml | Forms cream base with acid. |
| 8 | PEG- 200 | 1ml | 1ml | 1ml | 1ml | 1ml | 1ml | Acts as sec. humectant. |
| 9 | Glycerin | 1ml | 1ml | 1ml | 1ml | 1ml | 1ml | Acts as humectant. |
| 10 | Methylparaben | 0.04gm | 0.04gm | 0.04gm | 0.04gm | 0.04gm | 0.04gm | Preservative for water phase. |
| 11 | Distilled water | 15.58ml | 14.58ml | 13.58ml | 13.38ml | 13.18ml | 13.0ml | Acts as solvent. |
| 12 | Ficus racemosa extract | - | - | 1ml | 2ml | 3ml | 3.5ml | Has healing and moisturizing property. |

**Figure 4: Preparation of *Ficus racemosa* Foot Cream**

## RESULT

All the developed formulation were found to be homogeneous, non-greasy creamish white in colour with characteristic odour. The studies showed that $F_2$ formulation complies with requirement of physical parameters and found to be best among all batches[5].

**Table 4: Observation of evaluation parameter of *Ficus Racemosa* Cream**

| Parameter | F1 | F2 | F3 | F4 |
|---|---|---|---|---|
| Appearance | Good | Good | Good | Good |
| pH | 6 | 5.9 | 5.7 | 5.6 |
| Spreadability | 19.79gm.cm/s | 21.25gm.cm/s | 22.26gm.cm/s | 24gm.cm/s |
| Washability | Washable | Washable | Washable | Washable |
| Odour | Characteristic | Characteristic | Characteristic | Characteristic |
| Homogeneity | Homogenous | Homogenous | Homogenous | Homogenous |
| Type of emulsion | O/W | O/W | O/W | O/W |
| Color | Creamish white | Creamish white | Creamish white | Creamish white |
| Greasiness | Non-greasy | Non-greasy | Non-greasy | Non-greasy |
| Consistency | Good | Excellent | Satisfactory | Good |

**Table 5: Physical Parameter of *Ficus racemosa* Foot Cream**

| Parameters | Observation |
|---|---|
| Color | Creamish white |
| Odour | Aromatic and characteristics |
| Smoothness | Good consistency and smooth texture |

**Table 6: The analysis of phytoconstituents of *Ficus racemosa***

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

+ = Present - = Absent

## DISCUSSION

In the present study, skin cream was prepared using the herbal plant *Ficus racemosa.* The research work started with a wide and thorough literature survey. Various formulations were prepared by varying the amount of active ingredient concentration. Formulation of herbal foot cream for wound healing was successfully developed that met the relevant pharmaceutical characteristics. The prepared formulation is then evaluated for parameters like physical properties, pH, viscosity, spreadability and stability of the formulated cream. From the present study, it can be concluded that it is possible to develop creams containing herbal extracts that can be used as a barrier to protect the skin.

## CONCLUSION

Above experiment mainly includes *Ficus racemosa* foot cream which is the cream having good wound healing properties and shows positive result for all the performed tests. It is safe and healthy cream for application.

## OBSERVATION

pH= Hydrogen ion concentration
O/W= oil in water
W/O= water in oil
PEG-200= polyethylene glycol

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