

FORMULATION AND EVALUATION OF HERBAL FOOT CREAM**Riddhiben Gandhi^{1*}, Khadija Sodagar¹, Urvesh Parmar¹ and Reshma Jain²**

¹UG Student, Faculty of Pharmacy, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India.

²Assistant Professor, Faculty of Pharmacy, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India.

Article Received on
22 August 2023,

Revised on 12 Sept. 2023,
Accepted on 02 Oct. 2023

DOI: 10.20959/wjpr202317-29872

Corresponding Author*Riddhiben Gandhi**

UG Student, Faculty of
Pharmacy, The Maharaja
Sayajirao University of
Baroda, Vadodara, Gujarat,
India.

ABSTRACT

These days, skin conditions are a major cause of illness for people of all ages. If someone has a crack in their foot's heel, it hurts and is quite uncomfortable. Environmental factors contribute to the growth of germs and fungi on human skin. This factor is taken into account when creating HERBAL FOOT CREAM. That cream's function is to hydrate the heel, and its emulsion is w/o type (cold cream). Cold cream works by producing an oily coating on the skin that aids in reducing water loss from the skin to the environment. Water serves to hydrate and refresh the skin while beeswax and cocoa butter work as emollients, which aid to soften and smooth the skin. The key ingredient in these formulations is argan oil, which has vitamin E and is healthy for the skin since it hydrates. Neem extract also has antibacterial and

antifungal properties. Lemongrass essential oil is used in fragrances. This cream is homogeneous, spreads readily, and is naturally fatty. This is W/O emulsion and with an acidic pH (within the range of skin pH). There was no phase separation in this cream.

KEYWORDS: Argan oil, Lemongrass oil, Anti-healing, Fragrance, Foot cream etc.

INTRODUCTION

- The skin is external exposure of the body. The ageing is most visible on the skin. Nowadays, premature ageing is a big complication in the world because of the changes in an environment. Feet is important part of body; they suffer from many frictions. The lack of oil gland in the feet skin which results into very dry skin. External penetration of dirt,

fungus, bacteria cause cuts and wounds. Bacterial decomposition is also occurred in foot give bad odour. For these purpose herbal foot cream is prepared.

- This herbal foot cream is prepared from Argan oil (good for dry skin), Neem extract (antibacterial & antifungal effects), Aloe vera extract (for hydration) and lemongrass oil (fragrance). Other than synthetic compound, herbs have more effective, low cost, more availability, and less side effects. Here, ARGAN OIL have good property which give protection to the skin and lemongrass oil is having a good fragrance. Argan oil contains vitamin E which is known as anti-inflammatory agent in skin and several studies proves that vit E is good in seal up the cracks caused by dryness.



“Fig. 1: Argan oil”

MATERIALS

1. ARGAN OIL: [Figure.1]

Chemical constituents

- This oil is mainly rich in essential polyunsaturated fatty acids. It is a source of oleic acid and linoleic acid.
- Argan oil is rich in vitamin E. (good for skin)
- It is rich in minor and noble compounds like tocopherols, polyphenols, sterols, carotenoids, xanthophylls, squalene and saponins.

Benefits

- It gives hydration, elasticity, and wound healing effects on skin.
- It also gives hair elasticity, enhance the shine of hair, and prevent the hair breakage.
- It reduces the fasting blood sugar level and give resistance effect on insulin.
- It is a rich source of vitamin E which increase the rate of cell death on breast and colon cancer cell samples.

- Argan oil is frequently used to prevent and reduce stretch marks.

Side effect

- Argan oil may cause a form of allergy known as contact dermatitis, characterized by the development of rash, redness, and itchiness at the site of application.



“Fig. 2: Almond oil”

2. ALMOND OIL: [Figure.2]

Chemical constituents

- Almond contains 40–55% of fixed oil, about 20% of proteins, mucilage, and emulsion.
- The bitter almonds contain in addition 2.5–4.0% of the colourless, crystalline, cyanogenic glycoside amygdalin.

Benefits

- It contains unsaturated fats which reduce the risk of high blood pressure, obesity and reduce the risk of endometrial cancer.
- This oil is beneficial for both skin and hair. It has emollient property which reduce the water loss from the skin. It is a natural skin and hair moisturizer.
- It may help in skin from sun damage and premature aging and reduce the stretch mark on skin.

Side Effect

- People with tree nut allergies should not use almond oil, as it could trigger an allergic reaction.

- People with acne-prone skin who have not had luck with other kinds of oils may want to avoid applying almond oil directly to the face, as it may block pores and cause pimples and breakouts.
- Bitter almonds have medicinal properties, they can be toxic if they are not properly processed.



“Fig. 3: Aloe vera”

3. ALOE VERA: [Figure.3]

- Aloe vera extract is a colourless and transparent to brown, slightly viscous liquid. After drying, it becomes a yellow fine powder. It has a strong hydrating performance.

Chemical Constituent

- Aloe vera contains anthraquinone glycoside, polysaccharide, organic acid, amino acid, minerals vitamin plant sterols, plant hormone...
- The most basic function of aloe cream is to form a skin care film on the surface of the skin. It can protect or alleviate the skin irritation caused by factors such as climate change and environmental impact, and directly provide or appropriately supplement the skin with nutrients.

Benefits

- It has multiple function such as anti-acne, antiaging, increasing skin elasticity, sun protection, moisturizing, soothing, repairing after sun and relieving burn. Organic acid has significant effect on skin whitening and curing acne.



“Fig. 4: Aloe vera extract”

Method of Extraction: [Figure.4]

- Wash aloe vera leaf with water.
- Then cut sharped points with knife
- Remove the gel with the help of spatula from aloe vera
- Grind the gel in mixer and filter the mixture with muslin cloth in beaker.

4. NEEM

Chemical Constituents

- It is contained azadirachtin and related limonoids and contain glycerides, diverse polyphenol, nimbolide, triterpenes and beta-sitosterol. Leave contain quercetin, catechins, carotenes and vitamin C.

Benefits

- Neem is strong antioxidant, antimicrobial, anti-inflammatory agent, neutralizing free radicals and may be effective against different type of bacteria, viruses, and fungi.



“Fig. 5: Neem extract”

Method of extraction: [Figure.5]

- Take 10g of neem powder and mix it with 100ml distilled water.
- Keep it for 24 hours and stir it at interval of one hour.
- Filter the solution by using filter paper.

5. BEES WAX

- Beeswax is an excellent ingredient. It is used in natural and organic skincare. It is a thickening agent.
- Beeswax only works as a water-in-oil (W/O) emulsifier, meaning it will create heavy, greasy creams. That is why it is referred for cold creams. Here emulsifier is required because it can only emulsify a small amount of water and the emulsion will not be stable over a long period of time.

6. COCOA BUTTER

- Cocoa butter is a one type of vegetable fat which is come from cocoa beans. It is a common active ingredient in creams, lotions, lip balms.
- Cocoa contains polyphenols which is antioxidant, anti-inflammatory and protecting the skin for damage and prevent stretch mark which is developed during pregnancy.

METHODOLOGY**Table 1: Formulation table.**

Sr. No.	Ingredient	Quantity (%)	Uses
1	Argan oil (vit. E)	22.5	Good for dry skin
2	Almond oil	15	Perfume
3	Aloe vera	1.5	Moisturizer & Hydration
4	Bees wax	25	Skin soothing
5	Cocoa Butter	25	Emollient
6	Neem	1.5	Antibacterial & Antifungal
7	Lemongrass oil	1	For Fragrance
8	Glycerine	8.5	Humectant



“Fig. 6: oil phase”



“Fig. 7: water phase”



“Fig. 8: mortar-pestle phase”



“Fig. 9: Foot cream”

Procedure for Preparation of foot cream

- Take 7.5 gm of bees wax and 7.5 ml of Argan oil in the beaker. Place the beaker in hot water bath for melting the wax.
- Add 5 ml of almond oil in the mixture. Let the ingredients melt. [Figure.6]
- Then add cocoa butter and mix it well.

- After mixed and transfer in to mortar-pestle and make it normal cool. Add water phase [Figure.7] (mixture of aloe vera extract, neem extract and glycerin) drop by drop and avoid phase separation.
- Then add few drops of lemongrass oil for fragrance. Mix it well and store it in a suitable container. [Figure.8]



“Fig. 10: Spreadability test”.

EVALUATION OF FOOT CREAM

(1) Spreadability test: [Figure.10]

The Spreadability of samples was determined by taking 0.25 g cold cream formulation was placed on a glass slide over which a second glass plate was placed. A weight of 100 g was allowed to rest on the upper glass slide for 5 min. Spreadability refers to the area covered by a fixed amount of cold cream sample after the uniform spread of the sample on the glass slide. Measure the diameter of cream which is spread on slide.

$$\text{Spreadability (S)} = M \cdot L / T$$

M = weight (gm) tied to upper glass slide

L = length (cm) moved on a glass slide T=Time taken (sec)



“Fig. 11: pH measurement”

(2) pH measurement Test: [Figure.11]

Take 1 gm of sample and dissolve in 10 ml of alcohol. Dissolve it by heating on water bath for 10 mins. Then filter the content and then measure the pH using pH meter.

pH of cream is 5.58.



“Fig. 12: Dye test”

(3) Dye Test: [Figure.12]

Take 100gm amaranth dye (water soluble) mix with 10ml distilled water then take small amount of cream on slide and put the some drop of dye solution. After that put the coverslip on slide and observe under the microscope.

Here the cream is w/o type that is why the scattered globules (water phase) appeared red and continues phase (oily phase) is clear.

RESULTS

Table 2: Evaluation test results.

Evaluation Test	Result
Colour	Light Yellowish in colour
Odor	Citrus smell
Texture	smooth
Homogeneity test	Good Homogeneity
Appearance	Greasy and thin layer on application
pH	5.58
Washability	Non-washable
Spread ability	7.6 gcm/sec
Dye test	Water in oil type

CONCLUSIONS

According to the evaluation test results, argan oil, which is a key ingredient in herbal foot cream because it contains a higher proportion of vitamin E, is very helpful in mending the foot heel. Cream is created with water in an oil type. As a result, evaporation of water from skin reduces and prevent the skin from drying.

ACKNOWLEDGEMENT

We would like to express our gratitude to Faculty of Pharmacy, The Maharaja Sayajirao University of Baroda, for offering the opportunity to conduct project work on a herbal foot cream. We also want to express our gratitude to the faculty members who helped us along the way.

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