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“Formulation & Evaluation of *Millingtonia Hortensis* Cream by Invitro Method”

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Abstract-- The aim of this study was to prepare and evaluate a herbal cream from the leaf extract of *Millingtonia hortensis* which has a documented use in traditional medicine for treatment of respiratory disease and skin disorders.

The cream was formulated entirely with natural ingredients, namely, glycerol (humectant), shea butter (emollient), stearic acid (emulsifier), sodium carbonate (pH-adjuster). The objective was to develop a skin-friendly herbal cream with antibacterial and antifungal activity that can be used for topical applications.

The cream was evaluated in terms of organoleptic properties, pH, spreadability and stability, and/or evaluated for antibacterial activity against common skin microbial pathogens: *Staphylococcus aureus* and *Escherichia coli* through the agar well diffusion method.

The findings indicated that the cream had acceptable physical properties/characteristics and was able to create zones of inhibition indicating an antimicrobial activity was present.

As fulfill the aim of this study we provide a promising natural alternative for the treatment of minor skin infections/practice binding for dermatological application, while us blending both aspects: therapeutic and cosmetic.

Therefore, *Millingtonia hortensis* leaf extract-based cream could serve as a health care and well-being.

Keywords-- MILLINGTONIA HORTENSIS, Herbal cream, Antibacterial activity, Natural antibiotics, Topical formulation, Skin infections, Agar well diffusion, Stearic acid, Glycerol, Shea butter

I. INTRODUCTION

Millingtonia hortensis also known as Indian Cork Tree, is one of the promising herbal candidates for a topical antimicrobial agent.

It has been noted that the plant leaf extract, the active principle, has antimicrobial activity which is mainly due to the presence of flavonoid and saponin groups that have been detected in the extract. Besides, a wide array of herbal compounds such as tannins, coumarins, and triterpenes have also been isolated from the leaf, which explains its usage as an antiseptic and wound healer.

If *Millingtonia hortensis* is selected for a local antimicrobial agent, first of all, a dosage form should be decided. In general, the diabetic and obese patients are more prone to fungal infection in intertriginous areas of the body that require an ointment, cream, or powder to administer the medicinal agent. Therefore, it can be stated that there is a tremendous potential for phytodermatological products in the dermatological market in the near future.

This research will assist in the creation of a plant-based, safe, and effective topical antibiotic option that mimics the qualities of synthetic topical antibiotics, but with fewer side effects.

II. MATERIALS USED

Table 2

SL.NO	MATERIAL	SOURCE	uses
1	<i>Millingtonia hortensis</i>	Sourced from local garden	Provide skin healing & glowing effect
2	Shea Butter	Local Market, Bengaluru	Moisturizer & emollient
3	Stearic Acid	Vasa chemicals, Bengaluru	Emulsifying agent
4	Potassium Carbonate	From Ash	Maintains PH
5	Glycerol	Vasa chemicals, Bengaluru	humectant
6	Rose essence	Damascus Rose	fragrance
7	Natural coloring agent	Cypress vine flower	Natural color

Collection of plant materials: -*Millingtonia hortensis* collect from tree, Shea butter is collected from organic markets, Rose oil collected from the local market. All ingredients were pure and analytical.

III. METHOD OF FORMULATION

Dry Gum Method:

Preparation of base



Figure: Preparation of herbal extract

Table 2
 FORMULATIONS OF FACE GLOWING ANTIBIOTIC CREAM

Formulation	Stearic Acid	Shea Butter	Glycerol	Potassium carbonate	Herbal extract(Millingtonia Hortensis)
F1	5g	—	2ml	500mg	20ml
F2	5g	1g	2ml	500mg	20ml
F3	4g	3g	2ml	500mg	20ml
F4	5g	2.5g	2ml	350mg	20ml



Figure : Millingtonia hortensis

The solid ingredients like Stearic acid, Sodium carbonate were weighed accurately as mentioned in the formula.

1. Shea Butter, Stearic acid and Glycerol were heated till 70°C, meanwhile the herbal extract was prepared by boiling the herbal products such as *Millingtonia hortensis*,) and heated with distilled water at 100°C for 15 minutes.
2. The Shea Butter, stearic acid and glycerol mixture at 70°C were mixed with required amount of herbal extracts at 70°C were mixed and continuously stirred in a china dish by glass rod until cream was formed.
3. At the end, Damascus rose was added as rose essence and Cypress vine as coloring agent.

4. The formulations were then poured into a clean and tight container and were stored in a cool place.



Figure: Millingtonia hortensis cream

IV. EVALUATION OF HERBAL CREAM

1. Physical evaluation of face glowing and antibiotic cream:

Physical examination (color, odor, spreadability of herbal cream were assessed visually). Smelling the product revealed the presence of odor. The spreadability of the herbal cream formulation was verified by applying on the skin.

2. Determination of pH:

To 1gm of prepared herbal cream, add 9ml of freshly boiled and cooled water. Stir well make as suspension and pH was determined by using pH meter.

3. *Visual appearance:*

The color of cream and smoothness was observed.

4. *Spread-ability Test:*

About 1gm of sample was weighed and placed on centre of a glass plate. Another glass plate was carefully placed above the glass plate .100gm weight was placed up on upper slide so that the formulation between two slides will be present uniformly to form thin layer , the weight was removed and excess of formulation adhering the slides was scrapped off.

5. *Skin irritation test :*

The cream was placed on the skin of hand for a while. The skin was for any signs of redness and inflammation.

6. *Type of smear:*

The cream was applied on the skin surface in the form of

smear and checked of smear was oily or greasy like.

7. *Wash-ability :*

A small amount of cream was applied on hand and it was then washed with tap water.

8. *Stability studies :*

Stability problems like creaming phase inversion, thermodynamically unstable, flocculation & coalescence.

9. *Cycle testing:*

The formulations should pass three cycles of temperatures testing from 10°C to 25°C. Place the product at -10°C for 24hrs and place it room temperature 25°C for hours. This completes one cycle. If the product passes three cycles then it is said to be good degree of confidence in the stability of product. An even more rigorous test is a – 10 °C to 45°C five –cycle test. This puts cream under a tremendous stress and if it passes the test, indicates to have stable cream.

V. EVALUTION TEST FOR HERBAL CREAM

TABLE 3

PARAMETERS	F1	F2	F3	F4
<u>Colour</u>	pink	pink	pink	pink
Appearance	Smooth	Smooth	Smooth	Extra Smooth & creamy
Dilution	O/W	O/W	O/W	O/W
Determination of pH	6.2	6.0	6.1	5.8
Irritancy	Nil	Nil	Nil	Nil
Smear Type	Non - greasy	Non - greasy	Non - greasy	Soft & Non greasy
<u>Spreadability</u>	Good	Good	Good	<u>Emollient</u> (No residue)
Stability	Stable	Stable	Stable	Highly Stable

Comparative Evaluation: Formulated Herbal Cream vs. Marketed Cream (Nivea Soft)

TABLE 4

Parameter	Formulated Herbal Cream (<i>Millingtonia hortensis</i>)	Marketed Cream (Nivea Soft Moisturizing Cream)
Colour	Pink (natural extract)	Synthetic cosmetic fragrance
Odour	Pleasant mild herbal aroma	Synthetic cosmetic fragrance
Texture	Smooth, soft, and non-greasy	Smooth and soft
Spreadability	Excellent spreadability due to natural emollients	Good
pH	5.5–6.0 (ideal for skin barrier protection)	5.8
Consistency	Stable, uniform	Commercially uniform
Washability	Easily washable	Easily washable
Stability	Highly stable with no separation	Stable
Nature of Base	O/W type	O/W type
Moisturizing Effect	High—due to shea butter + glycerol combination	Moderate
Antimicrobial Activity	Strong activity against <i>S. aureus</i> & <i>E. coli</i>	No antimicrobial activity
Skin Irritation Test	No irritation (fully herbal)	No irritation
Overall Performance	Superior — provides moisturization + antimicrobial + herbal skin protection	Provides moisturization only



VI. RESULTS AND DISCUSSION

The four-formulation (F1, F2, F3, and F4) evaluation revealed that the creams were pink, smooth, and consisted of oil-in-water type emulsions. Moreover, all the creations were stable, without any phase separation.

The pH of each formulation was from 5.8 to 6.4, which is suitable for skin application. (F4) had the best pH value of 5.8 that is very close to the natural skin pH.

Every formulation was non-greasy and taken up by the skin effortlessly. F4, however, had the finest spreading ability with the skin being free of any residue, thus, indicating a higher emollient-specific action. The application was more uniform and smoother as compared to the rest three formulations.

The irritancy test did not reveal redness or irritation of the skin with any of the formulations. This suggests that the cream is safe for topical use. Smoothness and even consistency were the reasons why F4 was the most liked by the panel.

To sum up, all the formulations were almost the same in the measured parameters, but F4 was superior to the others in spreadability, evenness, and pH. Therefore, F4 was chosen as the formulation to be further development.

VII. SUMMARY

This research prepared and assessed four different herbal cream formulations (F1, F2, F3 and F4) that contained the extract of *Millingtonia hortensis* leaves. All the formulations exhibited the same typical features of a pink colour, smooth look, O/W emulsion type, non-greasy nature and good stability. The pH values of all the formulations were in the range suitable for skin application.

F4 among the four formulations exhibited the best overall results. It had the skin friendliest pH, outstanding spreadability, a smooth and uniform texture, and it did not leave any residue on the skin. All the formulations were non-irritant, however, F4 showed better user acceptability due to its consistency and ease of application.

Based on the evaluation results, F4 was chosen as the formulation to be optimized for further studies. The findings indicate that a herbal cream made from *Millingtonia hortensis* extract is a safe and stable topical preparation suitable for use.

VIII. CONCLUSION

This research primarily focused on creating and testing four herbal cream formulations made from *Millingtonia hortensis* leaf extract.

The physical properties of all the formulations were acceptable, i.e., they had a smooth texture, were non-greasy, O/W emulsion type, had appropriate pH values, and were stable.

Among them, F4 exhibited the highest number of features, i.e., ideal pH, excellent spreadability, uniform consistency, and high user acceptability. None of the formulations caused irritation, thus, they are safe for topical application.

F4 was chosen as the final product based on the testing parameters. The study expresses that a herbal cream made from *Millingtonia hortensis* extract is a safe, stable, and skin-friendly topical product of natural origin with potential benefits.

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