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FORMULATION AND EVALUATION OF POLYHERBAL ANTIFUNGAL CREAM CONTAINING CATHARANTHUS ROSEUS (SADAPHULI) AND PONGAMIA PINNATA (KARANJA) LEAF EXTRACTS

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- **ABSTRACT**

Skin-related fungal diseases rank among frequent dermatological problems and impact many people across the globe. Because they are considered safer, easier to obtain, and less likely to cause unwanted reactions, plant-based remedies are being chosen more often. This research centers on designing and assessing a multi-herb antifungal cream made sing leaf-derived extracts from Catharanthus roseus (Sadaphuli) together with Pongamia pinnata (Karanja). An oil-in-water emulsion served as the base, incorporating beeswax, liquid paraffin, glycerine, borax, methyl paraben, and peppermint oil. The finished product was examined for sensory attributes, acidity/alkalinity level, ease of spreading, ease of removal with water, potential to irritate, and additional physicochemical measures. Overall, the formulated cream demonstrated adequate physical qualities, a skin-appropriate pH range, and smooth application with good spread. Throughout testing, irritation was not detected. These results indicate the prepared polyherbal cream could be considered a promising antifungal product for topical use.

1. INTRODUCTION

Among infectious conditions seen globally, fungal disorders affecting the skin are especially prevalent. Dermatophytes, yeasts, and molds are the primary causative organisms; they involve the outer skin layers and produce effects including pruritus, erythema, and inflammatory changes. For superficial mycoses, antifungal creams applied to the skin are commonly used. Yet extended reliance on synthetic antifungals can bring issues like irritation, reduced responsiveness due to resistance, or allergic-type sensitivity reactions. As alternatives, herbal therapies have drawn interest since they come from natural sources and tend to be less toxic. Numerous medicinal species contain active constituents that act against microbes and Fungi, Catharanthus roseus has been reported to include alkaloids, flavonoids, and phenolic substances linked with antimicrobial effects (Mishra et al., 2022). In a comparable way, Pongamia pinnata carries constituents including karanjin and pongamol, and these have been described as having antifungal as well as antibacterial action (Bodiba et al., 2018) For this reason, adding extracts from these two plants into a topical dosage form could yield a useful herbal approach for treating fungal skin infections.

2. AIM AND OBJECTIVES

- **AIM**

The goal is to develop and assess a polyherbal antifungal cream that includes leaf extracts of Catharanthus roseus and Pongamia pinnata.

- **OBJECTIVES**

1. To obtain extracts prepared from the leaves of Sadaphuli and Karanja.
2. To develop a polyherbal antifungal cream incorporating the obtained extracts.
3. To examine the formulated cream for its physical characteristics and physicochemical parameters.
4. To evaluate how well it spreads, how easily it washes off, its pH, and whether it causes irritation.

MATERIALS AND METHODS

Table No. 1:

Sr.no	Name of Ingredients	Quantity	Role
1.	Sadaphuli leaves powder	1.37g	Antifungal
2.	Karanja leaves powder	1.37g	Antifungal
3.	Bees wax	2.05g	Thickener
4.	Liquid paraffin	4.80g	Emollient
5.	Glycerin	2.74ml	Moisturizer
6	Borax	0.34g	Emulsifier
7.	Methyl paraben	0.07g	Preservative
8.	Peppermint oil	0.14ml	Fragrance
9.	Talc	1.50g	Absorbent
10.	Distilled water	q.s	Vehicle

1. Sadaphuli leaves powder

Sadaphuli (Catharanthus roseus) is a widely available therapeutic plant that is broadly cultivated in tropical areas, including India. Classified within the Apocynaceae family, it has a long history of use in traditional healing practices. Its leaves possess multiple notable chemical components, including alkaloids, flavonoids, tannins, and phenolic substances.

Such plant-derived constituents are recognized for exhibiting both antimicrobial and antifungal actions. Leaf-based extracts may assist in limiting the proliferation of specific fungi responsible for cutaneous infections. This antifungal action is largely attributed to phenolics and alkaloids that disrupt fungal cell growth and development.

Given these features, Sadaphuli foliage is at times incorporated into herbal products—such as creams, gels, and ointments—aimed at treating skin infections. Alongside antifungal effects, the leaves also display mild anti-inflammatory and antibacterial activity, which can contribute to calming irritated skin and aiding the recovery process.

Fig. No. 1: Sadaphuli leaves powder.

2. Karanja leaves powder

Karanji (Pongamia pinnata) is a medicinal species found across numerous regions of India and is part of the Fabaceae family. In Ayurvedic practice, it has traditionally been utilized to address a range of skin-associated disorders. The leaves contain various active constituents, including flavonoids, tannins, karanjin, and pongamol. These ingredients underpin the plant's activity against fungi and other microbes. Preparations derived from Karanji leaves have demonstrated capacity to restrain fungi involved in frequent skin infections. Compounds in the leaves may influence fungal cell architecture and thereby slow their multiplication. Because of these therapeutic attributes, Karanji foliage is commonly included in herbal topical products, including creams and ointments, for handling fungal infections. Additionally, the leaves have anti-inflammatory and antiseptic qualities that may lessen itching, redness, and irritation linked to fungal skin conditions.

Fig. No. 2: karanja leaves powder.

3. METHODOLOGY

3.1 Collection and Authentication of Plant Material

Leaves from Sadaphuli (Catharanthus roseus) and Karanja (Pongamia pinnata) were obtained through a local provider. To clear away dirt and other contaminants, the gathered materials were washed thoroughly with water. Next, the leaves were dried in the shade for several days and subsequently placed in a hot-air oven to eliminate residual moisture. Once drying was complete, a mechanical grinder was used to crush the leaves into a coarse powder, which was then sieved to achieve a consistent particle size. Prior to additional experimental procedures, a botanist confirmed the identity of the plant materials.

3.2 Preparation of Plant Extract

Using maceration, extracts were produced from the powdered Sadaphuli and Karanja leaves. Each plant powder was independently immersed in solvents including ethanol, chloroform, petroleum ether, ethyl acetate, and methanol. The preparations were left undisturbed for a defined duration to allow effective removal of phytochemical constituents. Following this step, filtration through filter paper separated insoluble residues from the liquid portion. The collected filtrate was then concentrated and dried to yield a crude extract. Until needed for later work, the dried extracts were kept in a desiccator.[8]

3.3 Preliminary Phytochemical Screening

Qualitative assays were performed on the resulting extracts to determine which phytoconstituents were present. The screening aimed to identify groups such as alkaloids, carbohydrates, tannins, proteins, saponins, steroids, triterpenoids, flavonoids, and fixed oils.[9]

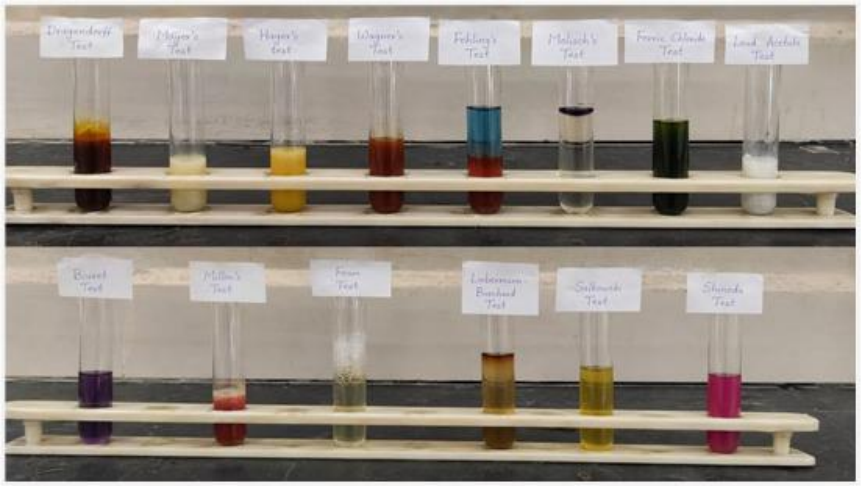

Fig. No. 3.

- **Test for Alkaloids**

Different reagents were used to detect alkaloids in the extract.

1. Dragendorff's Test

First, the extract was mixed into chloroform and then exposed to Dragendorff's reagent. Formation of a reddish-brown precipitate was taken as evidence that alkaloids were present.

2. Mayer's Test

Mayer's reagent was introduced into the extract solution, and a cream-toned precipitate appearing verified alkaloids.

3. Hager's Test
On adding Hager's reagent, a yellow precipitate appeared, showing alkaloids were present.

4. Wagner's Test
After Wagner's reagent was added to the extract solution, a reddish-brown precipitate developed, verifying alkaloids.

- **Test for Carbohydrates**

1. **Fehling's Test**

The extract was combined with equal amounts of Fehling's solutions A and B and then heated. A brick-red precipitate forming showed carbohydrates were present.

2. **Molisch's Test**

Molisch's reagent was applied to the extract, and concentrated sulphuric acid was then carefully layered. A violet ring at the junction verified carbohydrates.

- **Test for Tannins**

1. **Ferric Chloride Test**

When ferric chloride solution was added to the extract, a greenish or bluish colour developed, indicating tannins.

2. **Lead Acetate Test**

Adding lead acetate solution to the extract produced a white precipitate, confirming tannins were present.

- **Test for Proteins**

1. **Biuret Test**

Sodium hydroxide and copper sulphate solution were used to treat the extract. The appearance of a violet colour indicated proteins.

2. **Millon's Test**

Millon's reagent was added to the extract and the mixture was warmed gently. A red precipitate forming indicated proteins.

- **Test for Saponins**

1. Foam Test

The extract solution was shaken strongly and then left to stand. Stable foam formation showed the presence of saponins.

- **Test for Steroids and Triterpenoids**

1. Liebermann–Burchard Test:Acetic anhydride and concentrated sulphuric acid were used to treat the extract. A pink colour suggested triterpenoids, whereas a green colour indicated steroids.

2. Salkowski Test:

The extract was mixed with concentrated sulphuric acid; a yellow colour indicated triterpenoids, while a red colour suggested steroids.[16]

- **Test for Flavonoids**

1. Shinoda Test

Magnesium turnings along with concentrated hydrochloric acid were added to the extract solution. A magenta colour developing indicated flavonoids were present.[17]

- **Test for Fixed Oils and Fats**

1. Solubility Test

Fixed oils were observed to dissolve in non-polar solvents such as chloroform and diethyl ether, yet they did not dissolve in water.[18]

- **Translucent Spot Test**

1.A small amount of extract was dropped onto filter paper. After drying, the presence of a translucent spot confirmed fixed oils.[19]

- **Extraction of Sadaphuli Leaves (Soxhlet Extraction)**

Dried Sadaphuli leaves were ground to powder, and roughly 25 g of this powder was loaded into a Soxhlet unit. Ethanol served as the solvent, and the extraction continued for 6–8 hours. The collected extract was concentrated on a water bath and kept in an airtight container for later use in cream formulation.

- **Extraction of Karanja Leaves (Soxhlet Extraction)**

Karanja leaves were cleaned, shade dried, and milled into powder. Using a Soxhlet apparatus, about 25 g of the powder was extracted with ethanol as the solvent for 6–8 hours. The resulting extract was concentrated and preserved for preparing the cream.[21]

Fig No. 4.

Fig. No. 5.

4.2 Formula for 30g Cream

Table No.2.

Sr.no	Name of Ingredients	F1	F2	F3
1.	Sadaphuli leaves powder	1.5g	1.5g	1.37g
2.	Karanji leaves powder	1.5g	1.5g	1.37g
3.	Bees wax	1g	3g	2.05g
4.	Liquid paraffin	5ml	4ml	4.80ml
5.	Glycerine	2ml	3ml	2.74ml
6.	Borax	0.2g	0.5g	0.34g
7.	Methyl paraben	0.07g	0.07g	0.07g
8.	Peppermint oil	0.1ml	0.2ml	0.14ml
9.	Distilled water	q.s	q.s	q.s

4.3 Equipment Used

1. Analytical weighing balance
2. Beakers
3. Glass rod
4. Mortar and pestle
5. Water bath
6. Thermometer
7. Measuring cylinder

4.4 Method of Preparation

1. The cream was made using an emulsion-based method.
2. Beeswax and liquid paraffin, forming the oil phase, were heated on a water bath to about 70°C until fully liquefied.
3. Borax, glycerine, methyl paraben, and distilled water, constituting the aqueous phase, were warmed separately to the same temperature.
4. With constant stirring, the aqueous phase was slowly introduced into the oil phase to produce an emulsion.
5. Stirring was continued until a smooth, uniform cream base formed.
6. Sadaphuli and Karanja leaf extracts were then blended into the base.
7. Peppermint oil was included to provide fragrance.
8. The completed cream was mixed well and placed into an appropriate container for storage.

9. Evaluation of Antifungal Cream

Parameter	F1	F2	F3
Colour	Light green	Green	Uniform green
Odour	Mild peppermint	Strong peppermint	Pleasant peppermint
Appearance	Slightly non -uniform	Slightly greasy	Smooth and uniform
Texture	Slightly coarse	Sticky	Soft and smooth
Smoothness	Moderate	Moderate	Good
Result	Fail	Fail	Pass

Fig No. 6.

5.2 pH Determination

Batch	pH
F1	7.8
F2	7.4
F3	6

5.3 Spreadability Test

Formula used:

Spreadability = (Weight × Length) / Time

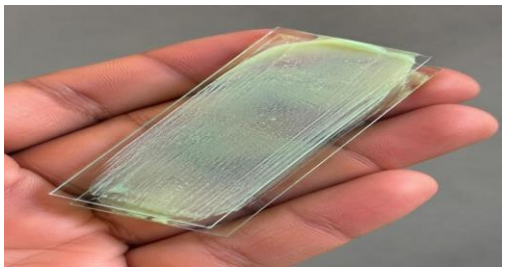

Fig. No. 7.

Batch	Time(sec)	Spreadability
F1	5.2	Poor spreadability
F2	6.1	Moderate spreading
F3	8.4	Good spreading

The cream showed smooth spreading on the skin.

5.4 Washability Test

Batch	Observation	Result
F1	Difficult to wash	Fail
F2	Slightly greasy after washing	Fail
F3	Easily washable	Pass

Fig. 8. Application of cream.

Fig. 9. After wash.

Fig 10: Viscometer.

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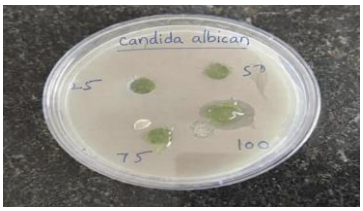
5.5 Viscosity test

Batch	Viscosity
F1	18,500cP
F2	21,200cP
F3	25,800cP

5.6 Antimicrobial Activity

Antifungal activity was evaluated by using agar diffusion method by noting the zone of inhibition.



5.7 Thermal Stability Test

The cream was stored at different temperatures to observe any change in colour, odor, or consistency.

6. Procedure for Application

1. The affected site was cleaned and dried.
2. A small amount of cream was put onto the infected area.
3. The cream was spread lightly across the skin surface.
4. The area was left untouched so absorption could occu

7. RESULTS

The prepared polyherbal antifungal cream exhibited satisfactory organoleptic and physicochemical characteristics. The pH of the cream was compatible with the natural pH of the skin. The cream demonstrated good spreadability and washability. No irritation or redness was observed during the irritancy test.

8. DISCUSSION

The results of the present study indicate that herbal extracts of Sadaphuli and Karanja can be effectively incorporated into a topical cream base. The prepared formulation exhibited acceptable stability, consistency, and skin compatibility. The antifungal activity of the formulation may be attributed to phytochemical compounds present in the plant extracts such as alkaloids, flavonoids, and karanjin. These compounds are known to inhibit fungal growth and support skin healing. The use of beeswax and liquid paraffin contributed to the cream's consistency, while glycerine helped maintain skin hydration.[24]

9. Benefits of Polyherbal Antifungal Cream

1. Provides localized treatment for fungal infections
2. Reduces itching and inflammation
3. Contains natural plant ingredients
4. Lower risk of adverse effects compared to synthetic drugs

10. Precautions

1. Apply only on clean and dry skin
2. Avoid contact with eyes and mucous membranes
3. Do not apply on deep wounds
4. Store in a cool and dry place

11. CONCLUSION

The present study successfully formulated a polyherbal antifungal cream containing extracts of Sadaphuli and Karanja leaves. The cream showed acceptable organoleptic characteristics, suitable pH, good spreadability, and no signs of skin irritation. The formulation demonstrates potential as a herbal topical preparation for the management of fungal infections. Further studies such as antifungal activity testing and stability studies are recommended to confirm its therapeutic effectiveness.

REFERENCES

1. Mishra D, Chitara MK. Phytochemical and antimicrobial properties of Catharanthus roseus. Emergent Life Sciences Research, 2022.
2. Bodiba DC et al. Antibacterial and antifungal activity of medicinal plants including Pongamia pinnata. Pharmacognosy Magazine, 2018.
3. Chavan P et al. Formulation and evaluation of polyherbal cream. International Journal of Current Pharmaceutical Research, 2020.
4. Chatur V et al. Development of herbal topical cream containing medicinal plant extracts. Journal of Drug Delivery and Therapeutics, 2022.
5. Gyawali R et al. Formulation and evaluation of herbal cream for topical application. Journal of Institute of Science and Technology, 2020.
6. Yan DH, Song X, Li H, Luo T, Dou G, Strobel G. Antifungal activities of volatile secondary metabolites of Catharanthus roseus. Journal of Fungi, 2018; 4(2): 65.
7. Mishra D, Chitara MK, Chaturvedi P. Study of phytochemicals, antioxidant activity and antimicrobial properties of Catharanthus roseus (L.) G. Don. Emergent Life Sciences Research, 2022; 8(1): 75–79.
8. Wahab NZ, Azizul A, Ibrahim N. Phytochemistry, cytotoxicity and biological activities of Catharanthus roseus. Iranian Journal of Microbiology, 2020;

12(5): 460–465.
9. Honnesh N, Saha S. Antibacterial and antifungal activity of selected Indian traditional medicinal plants including Pongamia pinnata. Journal of Pharmaceutical Research International. 2021; 33(60B): 623–634.
10. Bodiba DC, Prasad P, Srivastava A, Crampton B, Lall NS. Antibacterial activity of medicinal plants including Pongamia pinnata and their mechanisms of action. Pharmacognosy Magazine, 2018; 14: 76–80.
11. Chavan P, Kalshetti M, Navindgikar N. Formulation and evaluation of polyherbal cream. International Journal of Current Pharmaceutical Research, 2020; 12(4): 23–28.
12. Innovare Academics Chatur V, Ansari N, Joshi S, Walode S. Formulation and evaluation of polyherbal cream using medicinal plant extracts. Journal of Drug Delivery and Therapeutics, 2022; 12(3): 45–50.
13. Gyawali R, Gupta RK, Shrestha S, Joshi R, Paudel PN. Formulation and evaluation of polyherbal cream containing medicinal plant extracts for topical use. Journal of Institute of Science and Technology, 2020; 25(2): 61– 71.
14. Gurugram N, Kaushik A, Tuteja M. Development and evaluation of topical polyherbal cream containing medicinal plant extracts. Journal of Pharma Insights and Research, 2023; 5(1): 1–6.
15. Sunayana KC, Basyal D, Acharya A, Gyawali R. Formulation and evaluation of topical cream enriched with antimicrobial herbs. Banko Janakari / Biological & Pharmaceutical Research, 2024. Sharma P., Kumar V. (2018). Herbal medicines used in treatment of fungal skin infections. Asian Journal of Pharmaceutical and Clinical Research,
16. Mishra D, Chitara MK. Phytochemical and antimicrobial properties of Catharanthus roseus. Emergent Life Sciences Research, 2022.
17. Bodiba DC et al. Antibacterial and antifungal activity of medicinal plants including Pongamia pinnata. Pharmacognosy Magazine, 2018.
18. Chavan P et al. Formulation and evaluation of polyherbal cream. International Journal of Current Pharmaceutical Research, 2020.
19. Chatur V et al. Development of herbal topical cream containing medicinal plant extracts. Journal of Drug Delivery and Therapeutics, 2022.
20. Gyawali R et al. Formulation and evaluation of herbal cream for topical application. Journal of Institute of Science and Technology. 2020.
21. Yan DH, Song X, Li H, Luo T, Dou G, Strobel G. Antifungal activities of volatile secondary metabolites of Catharanthus roseus. Journal of Fungi, 2018; 4(2): 65.
22. Mishra D, Chitara MK, Chaturvedi P. Study of phytochemicals, antioxidant activity and antimicrobial properties of Catharanthus roseus (L.) G. Don. Emergent Life Sciences R. esearch, 2022; 8(1): 75–79.