International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

Formulation And Evaluation of Poly Herbal Anti-Fungal Cream.

R.Glory Therissa, Dr.S.Namratha, P.Twila Pushpa, Andem Vasavi, Kyama Soujanya

Department of Pharmacognosy Bharat Institute of Pharmacy, Mangalpally, Hyderabad,501510.
**Corresponding author: R.Glory Therissa Assistant Professor Department of Pharmacognosy BharatInstitute of Pharmacy, Mangalpally, Hyderabad,501510.*

Date of Submission: 05-07-2026 Date of Acceptance: 16-07-2026

ABSTRACT: Fungal infections are common dermatological issues, and the growing resistance to standard antifungal medications has led to increased interest in plant-based alternatives. This study focused on formulating a polyherbal antifungal cream using extracts and oils from Guduchi (*Tinospora cordifolia*), Sweet Basil (*Ocimum basilicum*), Neem (*Azadirachta indica*), Clove (*Syzygium aromaticum*), and Cinnamon (*Cinnamomum verum*). These botanicals are well regarded in traditional medicine for their antimicrobial and skin-healing properties. The cream was assessed for its physical and chemical properties, antifungal activity, and dermatological safety, showing its potential as a natural antifungal treatment.

Keyword: Guduchi (*Tinospora cordifolia*), Sweet Basil (*Ocimum basilicum*), Neem (*Azadirachta indica*), Clove (*Syzygium aromaticum*), and Cinnamon (*Cinnamomum verum*), Maceration, O/W Emulsion, Cream formulation, Polyherbal cream, Anti-fungal activity.

I. INTRODUCTION:

Fungal infections such as candidiasis, dermatophytosis, and tinea are prevalent in both tropical and temperate climates. While synthetic antifungal agents are commonly used, issues such as drug resistance, adverse effects, and high costs drive the need for safer, more sustainable alternatives. Polyherbal formulations are intricate blends that combine the strengths of two or more plants, leveraging their unique properties to enhance their therapeutic effects. In Ayurveda, the ancient text "Sarangdhar Samhita" highlights the principle of mutualism, which lays the foundation for these powerful combined remedies. Individual plant-based treatments often contain active compounds; however, their concentrations may not be adequate to achieve significant therapeutic results. Research has revealed that combining plants with diverse strengths can lead to more effective outcomes owing to synergistic interactions that optimize how the body absorbs and utilizes these compounds. Creams, typically formulated as semisolid emulsions for external application, present a versatile medium for delivering the benefits of herbal ingredients. They can be categorized into two types: water-in-oil (W/O), where water droplets are dispersed in oil, and oil-in-water (O/W), where oil droplets are dispersed in water. Natural herb-infused cosmetics are particularly remarkable for their ability to enhance skin health by providing hydration, nourishment, and moisture to maintain a vibrant complexion. This project is dedicated to the creation of an antifungal herbal cream that capitalizes on the remarkable properties of a carefully selected polyherbal blend. At its core are neem, known for its potent antifungal qualities; guduchi, celebrated for its immune-boosting effects; and Sweet Basil, clove, and cinnamon, revered for their overall health benefits. Together, these powerful plants are expected to work synergistically to create a cream that not only combats fungal infections but also promotes healthy and radiant skin.

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

The plant materials used to prepare the polyherbal antifungal cream are listed in table-1;

Herb Name	Biological Name	Family	Chemical Constituents	Uses	Plant Parts Used
Neem	*Azadirachta indica*	Meliaceae	Azadirachtin, Nimbin, Nimbidin, Nimbidol, Gedunin, Quercetin, Salannin	Antibacterial, antifungal, antiviral, Used in skin disorders, dental care, and wound healing, Acts as a blood purifier and is used in diabetes management, Insecticidal, Pesticidal properties	 Fig-01 –Leaves of *Azadirachta indica*
Guduchi	*Tinospora cordifolia*	Menispermaceae	Tinosporine, Tinosporic acid, Berberine, Magnoflorine, Alkaloids, Steroids, Glycosides, Polysaccharides	Immunomodulator and adaptogen, Antipyretics, Anti-inflammatory, Anti-diabetic, Used in treating chronic fevers, urinary tract infections, and liver disorders, Helps improve digestion, Reduce stress	 Fig-02- Leaves of *Tinospora cordifolia*
Sweet Basil	*Ocimum basilicum*	Lamiaceae	Eugenol, Methyl eugenol, Ursolic acid, Rosmarinic acid, Linalool, Apigenin, Flavonoids, Tannins	Carminative, stomachic, digestive aid, Antioxidant and antimicrobial, Relieves respiratory conditions, Adaptogen and stress reliever, Cardioprotective and immunomodulatory, Flavoring agent in food and beverages	 Fig-03- Leaves of *Ocimum basilicum*

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

Herb Name	Biological Name	Family	Chemical Constituents	Uses	Plant Parts Used
Clove	*Syzygium aromaticum*	Myrtaceae	Eugenol, Caryophyllene, Acetyl eugenol, Tannins, Flavonoids, Gallic acid	Analgesic, Antiseptic, Antioxidant, antimicrobial, carminative, Used in cough, cold, and digestive issues, Flavoring agent in culinary	 Fig-04- Dried flower buds of*Syzygium aromaticum*
Cinnamon	*Cinnamomum zeylanicum*	Lauraceae	Cinnamaldehyde, Eugenol, Cinnamic acid, Coumarin, Volatile oils, Tannins	Carminative, digestive stimulant, Antidiabetic and lipid-lowering properties, Antimicrobial, Antioxidant, Used in cold, indigestion, Used as a flavoring agent	 Fig-05- Dried bark of *Cinnamomum verum*

Table-01

The Equipments used in the preparation of the polyherbal antifungal cream are listed in table-02;

Table-02

Sr.no.	Name of the Instrument
1	Electronic weighing balance
2	Clevenger's apparatus
3	pH meter
4	Heating mantle
5	Electronic water bath
6	Others

II. EXTRACTION METHODS:

MACERATION;

Fresh green leaves of Guduchi, Sweet Basil, and Neem were collected and washed thoroughly to remove any dust or foreign particles. The leaves were then dried in the shade for a week. The dried leaves were crushed into a coarse powder and soaked in ethanol 99.99% (solvent) for approximately 3 weeks or until the extract was formed. After 3 weeks, the extracts were filtered using muslin cloth in china dishes, and the china dishes filled with the ethanol-leaf extracts were kept for evaporation until the green pigment in the bowl was completely dried.

NOTE: The dried leaves weighed approximately 96 g of Guduchi, 72 g of Sweet Basil, and 50 g of Neem. After macerating the dried leaves in ethanol 99.99% (solvent), the dried green pigment was weighed to be approximately 25g of Guduchi, 20g of Sweet Basil, and 20g of Neem (in approx.).

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

Fig-06 Coarse powder of leaves collected


Fig-07 Dried leaves soaked in ethanolfor maceration


Fig -08 Ethanolic extracts kept for evaporation


Fig-09 Completely dried ethanolic leaf extracts

CLEVENGERS APPARATUS;

A Clevenger's apparatus was used to extract clove and cinnamon oils. The raw materials used were approximately 100 g of clove buds in powder form and 100 g of cinnamon in powder form, and 1000 ml ethanol as the solvent for each raw material. The Clevenger's apparatus was set (flask, extractor, condenser), and the product obtained was nearly 5ml of clove oil and 5ml of cinnamon oil.

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

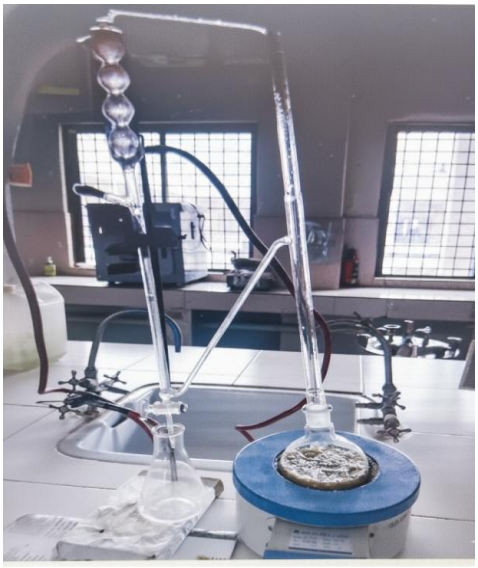

Fig-10 Clevenger's apparatus

PREMILINARY PHYTOCHEMICAL INVESTIGATION

Test for saponins

- Foam test:Place a small extract in a test tube with a small amount of water. Shake it vigorously. If foam remains for 10 minutes, it indicates the presence of saponin.

Test for alkaloids

- Mayer's test: 2-3 ml of the filtrate, when mixed with a small amount of Mayer's reagent, forms a precipitate.
- Wagner's test: When 2-3 ml of the filtrate is mixed with a small amount of Wagner's reagent, it produces a reddish-brown color.

Test for tannins

- Ferric chloride test:Add a few drops of neutral ferric chloride solution to the alcoholic extract. The development of a green color indicates the presence of tannins.

Test for flavonoids

- Shinoda test:Flavonoids, especially flavones and flavonols, react with magnesium metal and hydrochloric acid (HCl) to produce red, pink, or orange colors due to the reduction of flavonoids to anthocyanidins.

Test for reducing sugar

- Benedict's test:Combine equal amounts of Benedict's reagent and the test extract in a test tube. Heat the mixture in a boiling water bath for 5 minutes. The color of the solution changes to green, yellow, or red indicating the quantity of reducing sugar in the test solution.

Test for protein

- Biuret test:Mix 2ml of Biuret reagent with 2ml of the extract, ensuring thorough shaking, followed by gentle warming on a water bath. The development of a red or violet color indicates the presence of proteins. To 3ml of the extract, add 4% NaOH and a few drops of 1% CuSO4 solution. A violet or pink color will appear.

III. METHOD OF PREPARATION OF CREAM

The preparation of the polyherbal antifungal cream involved two main phases. Oil and aqueous phases. Initially, in beaker-A, the oil phase was prepared by gently melting beeswax in a clean beaker using a water bath maintained at approximately 70-75°C. Once fully liquefied, clove and cinnamon oils were added to the melted beeswax and stirred thoroughly to ensure uniform blending. Simultaneously, in beaker B, the aqueous phase is prepared by dissolving methyl paraben in a small portion of distilled water, with gentle heating if necessary to facilitate solubility. Glycerin, ethanolic herbal extracts of neem, Sweet Basil, and guduchi were added sequentially to this solution, and the mixture was stirred until a homogeneous solution was obtained. The two prepared phases were combined with continuous stirring to form a stable emulsion. The detailed formulation ingredients and their respective quantities are provided in table-03.

S.No.	Ingredients	Batches		
		F1 (15g)	F2 (10g)	F3 (5g)
1.	Neem (*Azadirachta indica*)	0.75g	0.5g	0.25g
2.	Guduchi (*Tinospora cordifolia*)	0.75g	0.5g	0.25g
3.	Sweet Basil (*Ocimum basilicum)*	0.75g	0.5g	0.25g
4.	Clove oil	0.75ml	0.5ml	0.25ml

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

5.	Cinnamon oil	0.45ml	0.3ml	0.15ml
6.	Bees wax	3.0g	2.0g	1.0g
7.	Methyl paraben	0.15g	0.1g	0.05g
8.	Glycerin	1.5ml	1.0ml	0.5ml
9.	Ethanol	1.5ml	1.0ml	0.5ml
10.	Distilled water	q.s to 15.0g	q.s to 10.0g	q.s to 5.0g

Table-03.

EVALUATION OF ANTIFUNGAL CREAM

- **Physical appearance:**Physical parameters such as color and appearance were evaluated.
- Homogenicity:All formulated creams underwent homogeneity testing through visual inspection post-container settling, assessing their appearance and the absence of any aggregates.
- **Measurement of pH:**The pH of different cream formulations was assessed using a digital pH meter. Specifically, 2.5 grams of each cream sample was precisely weighed and dispersed in 25 mL of distilled water, allowing it to sit for two hours. Ph measurements for each formulation were conducted three times, and the average values were reported. The pH of the dispersions was determined using a pH meter.
- **Spreadability:**The Spreadability of creams was assessed using a wooden block apparatus equipped with a pulley at one end. This method measured the slip and drag characteristics of creams. Approximately 2 grams of the cream under study were placed on a fixed ground slide. Another glass slide of the same dimensions as the ground slide, equipped with a hook, was placed on top to sandwich the cream. A weight of 1 kg was applied to the top slide for 5 minutes to remove air and ensure a uniform cream film between the slides. Excess cream was removed from the edges. Subsequently, a 50 g weight was pulled with a string attached to the hook, and the time (in seconds) taken for the top slide to travel a distance of 6.5 cm was recorded. A shorter time interval indicated better Spreadability.
  Spreadability was calculated using the following formula:
  S = M × L / T. Where, S = Spreadability, M = Weight in the pan (tied to the upper slide), L = Length moved by the glass slide,
  T = Time (i sec.) taken to separate the slide completely each other.
- **Viscosity:**The viscosity of the herbal cream was measured using a Brookfield rotational viscometer with spindle no. 64 at various speeds: 5, 10, 20, 30, and 50 rpm. Each measurement was taken after allowing the sample to reach equilibrium for two minutes. This procedure was repeated three times to ensure accuracy.

ANTI MICROBIAL ACTIVITY

Cup plate method:

Preparation of agar medium
Mix and combine the Sabouraud dextrose agar (SDA) with distilled water, heat the mixture until the agar dissolves completely. Sterilize the medium using an autoclave at 121˚C for 15 minutes. Ensure the pH is maintained between 7.2 and 7.4. Agar medium is then poured into Petri Plates and allowed to solidify.

Preparation of wells:
A standard suspension of *Candida albicans* is spread evenly over the surface of the agar plates. A sterile borer is used to create wells of a consistent size and depth.
Prepared antifungal sample, standard marketed product is added to the wells in desired concentrations.

Incubation:
The plates are incubated at an optimal temperature for the growth of*Candida albicans* between 25-30˚C for 24-48 hours.

Observation:
The antifungal agents inhibit the growth of *Candida albicans* around the wells called zone of inhibition, larger zone indicates more affective agent. A blank well is included to ensure the antifungal agent activity.

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

IV. RESULTS AND DISCUSSION

- **Results for evaluation of antifungal cream**

Table-04

S.no.	Tests conducted	Results
1.	Physical evaluation (color, odor, appearance)	+
2.	Homogenicity	+
3.	pH	+
4.	Spreadability	+
5.	Viscosity	+

- **Results of Anti-MicrobialActivity**

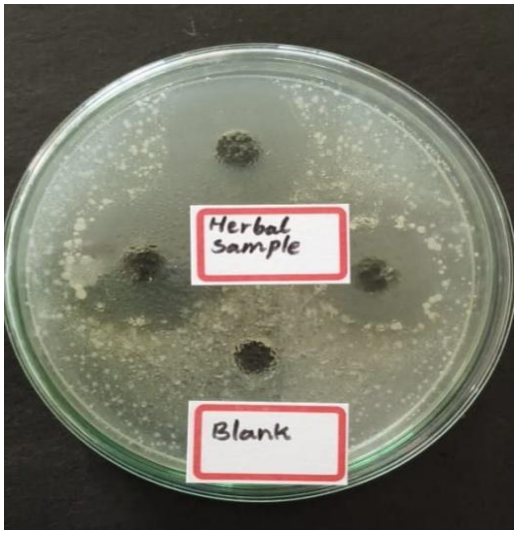

Fig-11

Fig-12

Fig-11; Zone of inhibition of polyherbal cream in different quantities v/s blank.

Fig-12; Zone of inhibition of prepared polyherbal cream compared with standard cream (fluconazole) against *Candida albicans*

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 4, Jul.-Aug. 2026, pp:396-404 www.ijprajournal.com ISSN:2456-4494

Fig-13.Poly herbal anti-fungal cream

Fig-14. Formulated Anti-fungal cream packed in collapsible/squeezable tube & labelled

V. DISCUSSION

The Polyherbal antifungal cream was developed using Neem, Guduchi, Sweet Basil, Clove oil, and Cinnamon oil, all recognized for antifungal, antimicrobial and skin-healing properties. Phytochemical screening confirmed the presence of flavonoids, alkaloids, tannins, terpenoids, glycosides, saponins, and essential oils, which are known to disrupt fungal membranes, inhibit enzymes, and suppress fungal growth.

The cream exhibited skin-compatible pH (5.5–6.5), smooth texture, good spreadability, and stability without phase separation or microbial contamination, indicating suitability for topical application.

In vitro antifungal tests showed significant inhibition against *Candida albicans*. The enhanced effect can be attributed to herbal synergy, where combined plant extracts produced stronger activity than individual ones. Each herb contributed uniquely—Neem (azadirachtin) damaged fungal membranes, Clove oil (eugenol) and Cinnamon oil (cinnamaldehyde) acted as potent fungicides, Sweet Basil offered antimicrobial and soothing effects, while Guduchi supported immunity and healing.

Unlike synthetic antifungal agents, this formulation offers a natural, safe, and skin-friendly alternative with reduced risk of irritation and resistance. However, further clinical trials and long-term stability studies are required to validate efficacy and ensure shelf-life.

VI. CONCLUSION

The findings of this study indicate that a polyherbal anti-fungal formulation can provide broad spectrum antifungal activity while being gentle on skin, with minimal/no side effectsas this supports natural and herbal-based topical treatments in fungal infections. The research highlights the benefits of herb-herb interactions which not only enhance efficacy but also reduce the risk of microbial resistance. Furthermore, the herbal cream is cost effective, eco friendly and aligns with the growing trend toward green and sustainable healthcare products.

Polyherbal antifungal cream is a plant based and can be considered a viable candidate for further development and commercialization in field of herbal dermatological products.

REFERENCES

[1]. Anil KN, Shahanawaj MS, Mahadev PS, Atul V, Ananda DS, Govind RC. Review on Formulation and Evaluation of Polyherbal cream.

[2]. Jagruti P. Pawar, Kishor Sanjay sawant, More prasad sunil, More Lankesh Rajaram, Zahid Anwer Ansari Shahid Ahmed, Formulation And Evaluation Of Herbal Anti-Fungal

cream, Int. J. of Pharm. Sci., 2024, Vol 2, Issue 7, 809-815.

[3]. Powar AD, Nitave SA. A Review–Polyherbal Antifungal Cream. World Journal Of Pharmaceutical Research. 2022 Mar 11:906-11.

[4]. Kishore G, PremChand GD. Preparation and evaluation of polyherbal antifungal cream.

[5]. Dhonnar RR, Agarwal MM, Agarwal Y. Formulation of antifungal polyherbal formulation and evaluation of in-vitro antifungal activity.

[6]. Patel, Madhavi & Patel, Komal & Bera, Kinjal & Prajapati, Bhupendra. (2024). Herbal formulations for the treatment of fungal infection. 10.1016/B978-0-443-15383-9.00030-5.

[7]. Sohail T, Khan RA, Imran H, Fareed G, Yasmeen S. Development and EvaluationAntimicrobial Poly-herbal Gel Formulation for the Treatment of Various Skin Infections.RADS Journal of Pharmacy and Pharmaceutical Sciences. 2022 Oct 31;10(3):92-9.

[8]. Jincy V Varghese., *et al*. "A Review on Formulation Andevaluationof Polyherbal antifungal Cream". *International Journal ofCreative Research Thoughts (Ijcrt)* 10.4 (2022).

[9]. Uma Devi P. Radioprotective, anticarcinogenic and antioxidant properties ofthe Indian holy basil. Ocimum sanctum(Tulasi). Indian J Exp Biol. 2001:39:185-190.

[10]. Gupta, S.K, Prakash J and Srivastava S. Validation of traditional claim of Tulsi,Ocimum sanctum Linn. as a medicinal plant. Indian J Exp Biol. 2002:5:765-773.