IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, May 2025
Impact Factor: 7.67

A Review on Polyherbal Antifungal Ointment

Pratiksha Kalyan Nakate and Kajal Bhaskar Walunj
Department of Pharmacognosy
Samarth Institute of Pharmacy, Belhe; Pune, Maharashtra, India

Abstract: *Fungal infections are a significant global health concern, often requiring prolonged treatment with anti-fungal agents that may have adverse effects or lead to resistance. This study focuses on the formulation and evaluation of a poly-herbal anti-fungal ointment incorporating extracts from pomegranate (Punica granatum), bael (Aegle marmelos), and papaya (Carica papaya). These medicinal plants are known for their potent antifungal, antimicrobial, and wound- healing properties The herbal extracts were obtained using suitable solvent extraction methods and incorporated into an ointment base using standard formulation techniques. The prepared ointment was evaluated for physicochemical properties, including spreadability, pH, viscosity, homogeneity, and stability. In vitro antifungal activity was assessed against common fungal pathogens such as Candida albicans and Aspergillus niger using the agar well diffusion method. Results indicated that the formulated polyherbal ointment exhibited significant antifungal activity, comparable to standard antifungal formulations. The formulation was stable,non-irritant, and showed good spreadability and consistency. This study highlights the potential of combining herbal extracts in topical formulations for safe and effective antifungal therapy.*

Keywords: polyherbal ointment, antifungal, pomegranate, bael, papaya, formulation, evaluation

I. INTRODUCTION

Indian herbs have long been cherished worldwide for their natural healing properties. With the rising demand for safer and more effective alternatives, herbal plants are gaining popularity in the global market. Unlike synthetic products, herbal remedies typically offer fewer side effects and better skin compatibility.Herbs possess a wide range of medicinal properties including antioxidant, anti-inflammatory, antiseptic, emollient, antifungal, and antibacterial actions. This makes them particularly valuable in skincare and treatment of common issues like fungal infections.Fungal infections, caused by organisms such as Candida and dermatophytes, often result in redness, itching, and irritation. While chemical antifungals are available, they can lead to side effects or resistance when used over time. Herbal ointments provide a natural, gentle, and effective alternative without toxic residues or irritation.India's rich traditional systems like Ayurveda, Unani, and even homeopathy have long emphasized herbal treatments. Texts such as the Rigveda and Yajurveda have documented the healing potential of herbs for centuries.Modern science is now catching up, aiming to improve herbal drug delivery methods for better efficacy. Today, herbal products are being developed in both crude and extract forms to offer more targeted relief and overall skin protection.Fungi are mostly multicellular eukaryotic heterotrophs that play a key role in nutrient cycling within ecosystems.

II. AIM AND OBJECTIVE

Aim: To formulate and evaluate a polyherbal antifungal ointment formulation

Objectives:

- Extract bioactive compounds from pomegranate, bael, and papaya using suitable extraction methods
- Optimize the concentration of plant extracts for maximum antifungal efficacy.
- Ensure safety for topical application through skin irritation tests.
- To improve patient compliance.
- Perform phytochemical screening to identify bioactive antifungal compounds such as tannins, flavonoids, alkaloids, and saponins.

DOI: 10.48175/568

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, May 2025
Impact Factor: 7.67

III. LITERATURE REVIEW OF WORK

Balakumar, Rajan, Thirunalasundari , Jeeva et al; 2011: In this review study evaluated the in vitro antifungal efficacy of Aegle marmelos (commonly known as bael) leaf extracts against clinical isolates of dermatophytes, including Trichophyton mentagrophytes, Trichophyton rubrum, Microsporum canis, Microsporum gypseum, and Epidermophyton fluoroscope. In this research Has been extensively studied for its antifungal properties of beal particularly in the formulation of herbal ointments.in this Research indicates that various extracts from different parts of the plant exhibit significant antifungal activity against a range of fungal pathogens.The minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) of various extracts and fractions of the leaves of Aegle marmelos were measured using method of National Committee for Clinical Laboratory Standard.this study concluded that Aegle marmelos leaf extracts significantly inhibit the growth of dermatophytic fungi and, upon further in vivo validation and compound isolation, could serve as a potential remedy for dermatophytosis.

Dr. K. Saravanasingh, M.D., P. George Erdrik and Dr. M. Ramamurthy, M.D. et al; 2016: Reviewed work on herbal antifungal ointment highlight the intrest in plant based treatment for fungal infection. Medicinal plant used such as Aegle maemelos is bacteriostatic at lower concentration but cidal at higher concentration, in most of the organisms studied, probably due to the interference by the active principles of the extract. Aegle marmelos contains a number of phytoconstituents which reveals its uses for various therapeutic purposes. The Plant or its individual parts can be used for the treatment of various disorders in human being such as, diabetes, liver toxicity, fungal infection, microbial infection, inflammation, pyrexia and to relieve pain.

Bhagyashri D.B et al; 2024:Oitment Formulated from extract of Aegle marmelos leaves in cause of fungal infection. Aegle marmelos commonly known as Beal, In this research study of formulation and evaluation Herbal ointment of beal leaves due to their anti Fungal property has been Traditionally used for its medicinal properties. The Aegle marmelos leaves were extracted using ethanol as solvent. The antifungal activity against common fungal infections such as candida albicans and Aspergillus fumigatus. The beal leaves have been use effectively in Anti bacterial, Anti-acne, Anti-inflammatory activities As per given activity with aim we focus on creation and assessment of a herbal ointment with antifungal properties.The ointment base was ready Following formulation completion, the product was assessed using the levigation method for assessment characteristics such as colour, smell, pH, consistency, spreadability, solubility, and washability. The beal leaves have been use effectively in Anti-bacterial, Anti-acne, Anti inflammatory activities As per given activity with aim we focus on creation and assessment of a herbal ointment with antifungal properties.

Dr. K. Saravanasingh, M.D., P. George Erdrik, Dr. M. Ramamurthy, M.D.et al; 2016:Reviewed work on herbal antifungal ointment highlight the intrest in plant based treatment for fungal infection. in most of the organisms studied, probably due to the interference by the active principles of the extract. Aegle marmelos contains a number of phytoconstituents which reveals its uses for various therapeutic purposes.Further investigations must be performed to examine the antifungal properties to other pathogenic fungi and bacteria at a higher concentration. It is quite evident from this review that Aegle marmelos contains a number of phytoconstituents which reveals its uses for various therapeutic purposes. The Plant or its individual parts can be used for the treatment of various disorders in human being such as, diabetes, liver toxicity, fungal infection, microbial infection, inflammation, pyrexia and to relieve pain.

Simone R Foss,Celso V Nakamura et al; 2014 :Research indicates that punicalagin, a predominant ellagitannin in pomegranate peel, exhibits potent antifungal activity. A study demonstrated that both crude pomegranate peel extract and isolated punicalagin were effective against dermatophytes The study also highlighted that punicalagin targets both conidial and hyphal stages of the fungi, suggesting its potential as a therapeutic agent in antifungal ointments. The crude extract and punicalagin showed activity against the conidial and hyphal stages of the fungi. The cytotoxicity assay showed selectivity for fungal cells than for mammalian cells.pomegranate is a good target for study to obtain a new antidermatophyte medicine.

Pedro Chávez-Quintal,Tania González-Flores,Ingrid et al; 2011: Ethanoic extracts from papaya leaves have shown inhibitory effects against phytopathogenic fungi such as Rhizopus stolonifer, Fusarium spp., and Colletotrichum gloeosporioides. The leaf extract exhibited the broadest action spectrum, indicating its potential as a source of natural antifungal compoundspomegranate is a good target for study to obtain a new

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, May 2025
Impact Factor: 7.67

antidermatophyte medicine.Bioactive compounds from vegetal sources area potential source of natural antifungic. An ethanol extraction was used to obtain bioactive compounds from Carica papaya L. cv. Maradol leaves and seeds of discarded ripe and unripe fruit.

IV. NEED OF WORK

➢ **Enhanced Skin Penetration and Healing Properties:**

- Herbal ointments can penetrate deep into the skin, providing prolonged action against fungal infections.
- Many herbs possess anti-inflammatory, wound-healing, and moisturizing properties, benefiting skin health.

➢ **Broad-Spectrum Activity of Herbal Extracts:**

- Many medicinal plants exhibit broad-spectrum antifungal activity due to the presence of multiple bioactive compounds.
- Combining multiple herbs enhances therapeutic efficacy through synergistic effects.

➢ **Natural, Safe, and Cost-Effective :**

- Herbal medicines are generally considered safer and more biocompatible than synthetic drugs.
- Herbs are often readily available and cost-effective, making treatment more affordable.

➢ **Growing Demand for Herbal and Ayurvedic Products:**

- Consumers prefer herbal skincare and medicinal products due to increasing awareness of chemical-free formulations.
- Herbal ointments align with the growing trend of natural and organic healthcare solutions.

➢ **Sustainable and Eco-Friendly Approach:**

- Herbal formulations reduce dependence on synthetic chemicals, minimizing environmental pollution.
- Sustainable harvesting and use of medicinal plants promote eco-friendly pharmaceutical development.

V. PLANT PROFILE

Parameter	Information	Information	Information
Drug Name	Beal	Papaya	Pomegranates
Image			
Scientific Name	Aegle marmelos	Carica papaya	Punica granatum
Taxonomical classification	Kingdom: Plantae Division:Magnoliophyta Class:Magnoliopsida Order: Sapindales Family: Rutaceae Genus: Aegle Species: Marmelos	Kingdom: Plantae Division :Magnoliopyta Class:Magnoliopsda Order: Brassicales Family: Caricaceae Genus: Carica Species: Carica papaya	Kingdom :Plantae Division:Magnoliophyta Class :Magnoliopsida Order : Myrtales Family: Punicaceae Genus :Punica Species:Granatum
Family	Family: Rutaceae	Family: Caricaceae	Family: Punicaceae
Chemical constituents	Rutin,Aegeline Marmeline,Marmesin,Eugen	Carpaine, Pseudocarpaine,Papain	Ellagic acid,Gallicacid,Punicalagin,

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 9, May 2025 Impact Factor: 7.67

	ol,Citral,Umbelliferone,Quercetin,Lupeol,β-sitosterol.	(proteolytic enzyme),Chymopapain,Kaempferol,β-carotene,Lycopene,Linalool,α-terpinene.	Punicalin,Ellagitannins,Gallotannins,Pelletierine,Iso-pelletierine,Ursolic acid,Betulinic acid.
Organoleptic character colour	Light Green	Dark Green	Dark Brown
Odour	Floral aroma	Fragnant	Strong tannic odour
Taste	Sweet	Bitter	Astringent,bitter
Powder characteristics	High carbohydrate,moderate protein,fiber content.	Fibers content,calcium oxalate crystal,starch grain.	Fibers content,rich in tannins and gallic acid.
Uses	Digestive health,antifungal, anti-inflammatory	Digestive aid, wound healing	Inhibits Fungal Growth,Reduces Inflammation
Hygroscopicity	Highly hygroscopic	-	Hygroscopic

Table 1. plant profile.

VI. PLAN OF WORK

Selection and procurement of botanical ingredients.
Extraction and formulatiom development.
Trial batches of Anti-Fungal Activity.
1. Conduct Antifungal assay(zone inhibition,MIC,MFC)
2. Determine Ointmemt effectiveness against target microorganisms
3. Compare Ointmemt activity with control.
Physical evaluation parameters The physio-chemical evaluation test is going to carried out as per below standard method
1. pH value
2. Homogeneity
3. Spreadability
4. Viscosity determination
Stability study and optimization.

VII. CURRENT WORK AND PRELIMINARY WORK

A. Authentication of plant in process:

➢ Beal leaves
➢ Papaya leaf
➢ Pomegranate peel

B. Preformulation study: Preformulation studies are crucial in the development of an ointment to ensure the stability, efficacy, and compatibility of the ingredients. The following studies
should be conducted:
1) Extract Characterisation: Organoleptic properties,Solubility analysis, Physio chemical screening, pH determination.
2) Ointment base selection :
a) Selection of Base Type: Hydrocarbon Base, Absorption Base, Water-soluble Base, Emulsion Base.
b) Spreadability test.
c) Ability of Ointmemt base.
3) Antifungal study :
a) Zone of inhibition test

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, May 2025
Impact Factor: 7.67

b) MIC (minimum inhibitory concentration) determination

c) Minimum Fungicidal Concentration (MFC) Test .

Formulation Tablet: To formulate and evaluate polyherbal Antifungal ointment (10 gm)

Sr.no	Ingredients	Quantity	Role
1.	Beal leaves extract	5 ml	Antifungal
2	Papaya leaves extract	5 ml	Skin renewal
4.	Beeswax	7.5 gm	Ointment base
5.	Lanoline	5 gm	Emoilent
6.	Honey	6.25 ml	Essential oil
7.	Sandalwood oil	1-2 Drops	Preservative
8.	Orange colour	1-2 Drops	Colouring Agent
9.	D.W	Q.S	Preservative

REFERENCES

[1]. Bhor BD, Varma DS. A review on formulation and evaluation of anti-fungal activity of Aegle Marmelos ointment. Int J Multidiscip.2024 April 1;7(6)2582.

[2]. Balakumar R, Rajan S, Thirunalasundari T, Jeeva S. A review on antifungal activity of Aegle Marmelos (L.) Correa (Rutaceae) leaf extract. Asian Pac J Trop Biomed. 2011 1;4(4)309.

[3]. Saravanasingh K, George Frdri P, Ramamurthy M. A study on antibacterial and antifungal Activities of extracts of medicinal plant Aegle marmelos. Int J Adv Res Biol Sci. 2016 1;8(2) 321.

[4]. Aljuhani S, Rizwana H, Aloufi AS, Alkahtani S, Albasher G, Almasoud H, Elsayim R. A review On antifungal activity of Carica papaya fruit extract against Microsporum canis: in vitro and in Vivo study. Frontiers. 2024 1;12(12)789.

[5]. Jovana Dimitrijevic,Marina Tomovic, Jovana Bradic ,Anica Petrovic ,Vladimir Jakovljevic et al a review on Punica granatum L. (Pomegranate) Extracts and Their Effects of Healthy and Diseased Skin in MDPI 2024 1;24 (12)458.

[6]. Asha AP, Prajwal AK, et al. A review on formulations and evaluation of antifungal cream Containing Carica papaya leaf extract. World J Pharm Sci. 2025 1;9(1)112.

[7]. Pedro Cha´vez-Quintal et al review on Antifungal Activity in Ethanolic Extracts of Carica Papaya Maradol Leaves and Seeds in Indian J microbial 2011 1;7(1)54.

[8]. Surabhi Maske , Farhat Daud, Formulation and Evaluation of a Moisturizing Cream Using Aegle Marmelos Leaves Extract, International Journal of Science and Research (IJSR) Index Copernicus Value 2016 1;6(5)34.

[9]. K. Suresh, P.K. Senthilkumar B. Karthikeyan, Anti microbial Activity of Aegle Marmelos Against Clinical Pathogens, Journal of Phytology 2009 1;4(5)88.

[10]. Patkar Atul N, Desai Nilesh V, Ranage Akkatai A, A Review on Aegle Marmelos: A Potential Medicinal Tree, International Research Journal of Pharmacy IRJP 20121;7(3)65