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FORMULATION AND EVALUATION OF POLYHERBAL TOPICAL ANTIMICROBIAL CREAM

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Abstract

In recent times, herbal therapeutics have received significant interest due to their high efficacy and safety profile, offering fewer adverse effects than synthetic alternatives. Botanical sources like *Moringa oleifera* and *Ocimum sanctum* (Tulsi) are recognized for their potent antimicrobial attributes and have a long history in treating diverse dermatological conditions. This research review examines the antimicrobial capabilities of these plant extracts and explores their integration into topical drug delivery systems.

Keywords: *Moringa oleifera*, *Ocimum sanctum* (Tulsi) leaves extract, Antimicrobial cream.

Introduction

Topical medical creams are essentially semi-solid or high-viscosity liquid emulsions where active pharmaceutical ingredients are either dissolved or suspended within the emulsion base for external application [Barry, 1999; Okorie and Ofoefule, 2002][(1)]

Moringa oleifera, commonly identified as the drumstick tree, is a plant celebrated for its exceptional therapeutic and nutritional value. This species is highly regarded for its diverse medicinal properties. Because the leaves of Moringa are rich in vital micronutrients like iron and provide significant energy, they represent an ideal dietary supplement to address the nutritional requirements of growing adolescents[(2-3)]

Tulsi, scientifically classified as *Ocimum sanctum* within the Lamiaceae family, is frequently termed the "Queen of Herbs" due to its extensive pharmacological utility and prevalence in herbal medicine. The two primary variants, Green Tulsi (Ram Tulsi) and Black Tulsi (Krishna Tulsi), share largely comparable biological traits. Beyond its medicinal role, Holy Basil serves as a profound cultural symbol and carries immense religious weight in Hindu traditions[(4)]

In the Ayurvedic system, Tulsi is viewed as a cornerstone medicinal plant that promotes a holistic strategy for health maintenance. Sensorial, Tulsi is noted for its distinctly bitter flavor profile[(5)]

Plant Profile

1 Tulsi (*Ocimum sanctum*)

1.1 Geographical source:

Holy basil is globally distributed and can be found in nations such as India, Bangladesh, China, Sri Lanka, Myanmar, and Thailand. Furthermore, Tulsi thrives in the arid sandy terrains of regions like Indonesia, Cambodia, and Laos[6].

Fig 1 : Ocimum sanctum (Tulsi)

Fig 2 : Leaves of Ocimum sanctum

1.2 Taxonomical classification of tulsi kingdom[7]

- **Botanical name:** *Ocimum sanctum*
- **Kingdom:** Plantae
- **Phylum:** Spermatophyta
- **Class:** Magnoliopsida
- **Family:** Lamiaceae
- **Genus:** Ocimum
- **Species:** *Ocimum sanctum*

1.3 Antibacterial and Antifungal activity:

Most species under the *Ocimum* genus synthesize essential oils that display robust antibacterial, antiviral, and antifungal properties. As the rise of antibiotic-resistant pathogens poses a severe clinical challenge, herbal medicines are being explored as viable alternatives. Research indicates that Tulsi leaves exhibit powerful antifungal effects against *Aspergillus* species. Specifically, the essential oil derived from *Ocimum gratissimum L.* has shown *in vitro* success against *Aspergillus* by compromising the fungal cell membrane, leading to the drainage of cellular components and growth cessation[8].

2 Moringa Oleifera:

2.1 Geographical source:

This tree is found growing naturally in the Sub-Himalayan regions stretching from Chenab to Oudh, surviving at altitudes ranging from sea level up to 1400 meters. It is frequently grown near residential areas in Bengal, Assam, and peninsular India, known for its vigorous coppicing ability[9].

Additionally, cultivation extends to north-eastern parts of Bangladesh and Pakistan, the Arabian Peninsula, Sri Lanka, West Asia, and across East and West Africa. It is also prevalent throughout the West Indies, southern Florida, and various regions of Central and South America, including Peru, Mexico, Paraguay, and Brazil[10].

Fig 3 : Leaves of Moringa Oleifera

Fig 4 : Moringa Oleifera

2.2 Taxonomic position of *M. oleifera*[11]

- **Kingdom:** Plantae
- **Superkingdom:** Tracheobionta
- **Superdivision:** Spermatophyta
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Subclass:** Dilleniidae
- **Order:** Capparales
- **Family:** Moringaceae

2.3 Antimicrobial activity:

The antimicrobial properties of *Moringa oleifera* were documented by A. Cáceres et al. (1991), who tested extracts from the seeds, bark, roots, and leaves against various yeasts, bacteria, helminths, and dermatophytes using disk-diffusion assays. Growth inhibition of *Staphylococcus aureus* and *Pseudomonas aeruginosa* was observed with aqueous seed extracts and fresh leaf juice. However, no significant activity was recorded against *Candida albicans* or other specific Gram-negative and Gram-positive pathogens[12].

Material and Method

3 Material

Freshly harvested leaves of *Ocimum sanctum* and *Moringa oleifera* were procured for the extraction phase, utilizing ethanol as the primary solvent. The formulation of the antimicrobial cream involved several auxiliary ingredients: cetostearyl alcohol, liquid paraffin, stearic acid, propylene glycol, propyl paraben, methyl paraben, triethanolamine, and deionized water. Every chemical used in this process was of analytical grade.

4 Method

4.1 Collection of materials:

The plant materials (*Moringa oleifera* and *Ocimum sanctum*) were obtained from the local vicinity of Kurtadi, Hingoli. The leaves were subsequently subjected to shade drying.

4.2 Processing of crude drug:

The extraction process utilized leaves that had been dried in the shade and finely pulverized.

Fig 5 : Tulsi Leaves Powder

Fig 6 : Moringa Oleifera Leaves Powder

4.3 Method of Extraction

Simple maceration: In this technique, the coarsely ground or whole crude drug is submerged in a solvent within a sealed vessel. The mixture is kept at room temperature for a minimum of 3 days and agitated periodically to ensure the soluble components dissolve. Finally, the mixture is strained, the solid residue (marc) is pressed, and the resulting liquid is purified through decantation or filtration[13].

Fig 7 : Tulsi and Moringa Leaves Powder Extraction

Fig 8 : Tulsi and Moringa Leaves Powder Filteration Process

Result and Conclusion:

The developed polyherbal antimicrobial cream, featuring *Ocimum sanctum* and *Moringa oleifera* extracts, exhibited favorable pharmaceutical and physical properties, including consistent homogeneity, an ideal pH, excellent spreadability, and an appealing appearance. The bioactive phytochemicals present in both botanical extracts enhance their antimicrobial efficacy, potentially helping manage microorganisms linked to skin ailments. These findings suggest that the herbal cream is a viable, safe, and efficient topical antimicrobial agent. Consequently, formulations utilizing Tulsi and Moringa extracts may serve as potent natural substitutes for standard antimicrobial treatments.

Referance

1. Formulation and Evaluation of Antimicrobial Topical Creams from Ethanol Extract of Vernonia ambigua Leaves S. E. OKAFO 1A-F, C. O. ANIE2ACEF, M. C. NWANUA1B-D Okafo et al./Nig.J.Pharm. Res. 2019, 15 (2):249-255.
2. Anand Singh, S Patel, Y Patel, et al, 2023. Formulation, Evaluation, and Antimicrobial Study of Immune-Boosting Herbal Tea. Pharmaspire. 15(03), Pages 112–120. Doi: https://doi.org/10.56933/pharmaspire.2023.15121.
3. Sandhya J J, Kanniammal C, 2024. Development of Millet-Based Moringa - Amla Snack Bar for Iron Deficiency in Adolescents. Nutricion Clinica y Dietetica Hospitalaria.44(2), Pages 331–337. Doi: https://doi.org/10.12873/442sandhya.
4. Singh N., Hoette Y., Miller R. (2010). Tulsi: The Mother Medicine of Nature. 2nd ed. Lucknow: International Institute of Herbal Medicine, 28–47.
5. Bhooshitha AN, Abhinav Raj Ghosh, Chandan HM, Nandhini HS, Pramod BR, KL Krishna., Review on Nutritional, Medicinal and CNS Activities of Tulsi (Ocimum. Sanctum), Journal of pharmaceutical science and research,2020;12(3):420-426.
6. Mahesh V. Bawage, Sohel Jafar Shaikh, Shyamlila B. Bavage, Nandkishor B. Bavage., preparation and standardization of Tulsi leaf tablet (Ocimum Sanctum Linn)., International Journal of Innovative research in technology.2021;8(3).
7. Bono N. Ahmed A, tanveer M, Khan GM, Ansari MT- Pharmacoligical evaluation of ocimum sanctum (2017)
8. ROSHAN KUMAR, PURABI SAHA, SHRESTHA SARKAR, NIKIT RAWAT AMIT PRAKASH, "A REVIEW ON NOVEL DRUG DELIVERY SYSTEM", IJRAR - International Journal of Research and Analytical Reviews (IJRAR), E-ISSN 2348-1269, P- ISSN 2349-5138, Volume.8, Issue 1, Page No pp.183-199, January 2021.
9. R.K. Gupta. Medicinal & Aromatic Plants. CBS publishers & distributors, 2010, 151-152.
10. A. Roloff, H. Weisgerber, U. Lang, B. Stimm. Enzyklopädie der Holzgewächse, Handbuchund Atlas der Dendrologie. 2009, 1-8.
11. History, Taxonomy and Propagation of Moringa oleifera-A Review Ramachandraiah Mallenakuppe1*, Harini Homabalegowda2 Mahadevappa Demappa Gouri3 Prasanna S. Basavaraju4 Umashankar B. Chandrashekharaiah5 SSR-IIJLS by Society for Scientific Research under a CC BY-NC 4.0 International License Volume 05 | Issue 03 | Page 2322.
12. A. Cáceres, O. Cabrera, O. Morales, P. Mollinedo, P. Mendia. Journal of Ethnopharmacology, 1991, 33(3), 213-216.
13. Sukhdev Swami handa, suman preet Singh Khanja, Gennaro, Longa, Dev Dutt RakeshExtraction Technologies for medicinal and aromatic plants (2008).