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COMPARATIVE EVALUATION OF ANTIMICROBIAL ACTIVITY OF SURYAPAKI KUSHTHARAKSHASA TAILA PREPARED WITH WATER AND WITHOUT WATER BY WELL DIFFUSION METHOD

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ABSTRACT

Background: Kushtharakshasa Taila is a classical Ayurvedic medicated oil indicated in various skin disorders. Sneha Kalpana prepared through Suryapaka is considered a unique pharmaceutical process that facilitates extraction of active principles from herbal ingredients. The present study was undertaken to evaluate and compare the antimicrobial activity of Suryapaki Kushtharakshasa Taila prepared with water and without water. **Objective:** To evaluate and compare the antimicrobial efficacy of Kushtharakshasa Taila prepared with water and without water against selected bacterial and fungal pathogens. **Materials and Methods:** Antimicrobial activity was assessed by the agar well diffusion method using Streptococcus pyogenes, Staphylococcus aureus, and Candida albicans. The test samples included Kushtharakshasa Taila prepared with water and Kushtharakshasa Taila prepared without water. Thirty microliters (30 µl) of each sample were introduced into wells prepared on inoculated agar plates. Fusidic acid (10 µg) and Fluconazole (25 µg) served as standard antimicrobial agents. The plates were incubated at 37°C for 24 hours, and the zones of inhibition were measured. **Results**: Kushtharakshasa Taila prepared with water demonstrated zones of inhibition of 2.3 cm against Streptococcus pyogenes, 2.3 cm against Staphylococcus aureus, and 2.4 cm against Candida albicans. Kushtharakshasa Taila prepared without water exhibited zones of inhibition of 1.6 cm, 1.7 cm, and 2.1 cm respectively against the same organisms. Both formulations showed antimicrobial activity; however, the preparation with water exhibited comparatively greater inhibitory effects. **Conclusion:** Suryapaki Kushtharakshasa Taila prepared with water possesses superior antimicrobial activity compared to the formulation prepared without water. The enhanced activity may be attributed to improved extraction and incorporation of active phytoconstituents during preparation.

KEYWORDS: Kushtharakshasa Taila, Suryapaki Sneha Kalpana, Antimicrobial Activity, Well Diffusion Method.

INTRODUCTION

Skin disorders (Kushta) are among the conditions extensively described in Ayurvedic literature, and numerous formulations have been prescribed for their management. Kushtharakshasa Taila is one such classical medicated oil mentioned in Bhaishajya Ratnavali for external application in various dermatological conditions.[1]

Sneha Kalpana represents an important pharmaceutical dosage form in Ayurveda wherein the therapeutic principles of herbal drugs are incorporated into lipid media. The process enhances stability, bioavailability, and tissue penetration of the active constituents. Suryapaka, a unique method of Sneha preparation, utilizes solar heat for gradual extraction and processing of medicinal ingredients, thereby preserving thermolabile

constituents and facilitating the incorporation of bioactive compounds into the oil base.[6]

Microorganisms play a significant role in the initiation and progression of many skin infections. The emergence of antimicrobial resistance and the increasing interest in plant-based therapeutics have encouraged scientific evaluation of traditional Ayurvedic formulations. Kushtharakshasa Taila contains several ingredients known for their antimicrobial, antifungal, anti-inflammatory, and wound-healing properties.[5] The present study was therefore undertaken to evaluate and compare the antimicrobial activity of Suryapaki Kushtharakshasa Taila prepared with water and without water against selected bacterial and fungal pathogens using the agar well diffusion technique.[2,3]

MATERIALS AND METHODS

Study Design

An experimental in vitro comparative study was carried out to evaluate the antimicrobial activity of Kushtharakshasa Taila prepared with water and without water.

Test Samples

1. Kushtharakshasa Taila with Water
2. Kushtharakshasa Taila without Water

Test Organisms

- Streptococcus pyogenes
- Staphylococcus aureus
- Candida albicans

Materials Used

Sl. No.	Material	Source	Catalogue No.
1	Antibiotic Assay Medium A	HiMedia	ME003
2	Petri Plates	Tarsons	460096
3	1000 µl Tips	Tarsons	521020
4	200 µl Tips	Tarsons	521014

Preparation of Inoculum

Cell suspensions of Streptococcus pyogenes, Staphylococcus aureus, and Candida albicans were prepared and cultured on suitable media. Cultures were incubated at 35°C for 48 hours. The microbial suspensions were standardized to approximately 2×10^6 cells/ml.

Antimicrobial Assay

The antimicrobial activity was determined by the agar well diffusion method.[1] Sterile agar plates were inoculated with the test organisms. Wells were prepared aseptically in the agar medium. Thirty microliters (30 µl) of the test samples were introduced into the wells. Standard antimicrobial discs containing Fusidic acid (10 µg) for bacterial strains and Fluconazole (25 µg) for fungal strains were used as positive controls.[2]2

The inoculated plates were incubated aerobically at 37°C for 24 hours. Following incubation, the zones of inhibition around the wells were measured and recorded.[1]

RESULTS AND DISCUSSION

Comparative Antimicrobial Activity

Test Organism	Standard Drug	Standard Zone of Inhibition (cm)	KR Taila with Water (cm)	KR Taila without Water (cm)
Streptococcus pyogenes	Fusidic Acid (10 µg)	0.4	2.3	1.6
Staphylococcus aureus	Fusidic Acid (10 µg)	0.4	2.3	1.7
Candida albicans	Fluconazole (25 µg)	0.6	2.4	2.1

The findings of the present study indicate that both formulations of Kushtharakshasa Taila possess appreciable antimicrobial activity against the tested microorganisms, namely *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Candida albicans*. However, the formulation prepared with water consistently demonstrated larger zones of inhibition compared to the formulation prepared without water.

The antibacterial activity observed against *Streptococcus pyogenes* and *Staphylococcus aureus* suggests the ability of the formulation to inhibit the growth of common pathogenic organisms associated with skin and soft tissue infections. Similarly, the marked inhibition of *Candida albicans* indicates notable antifungal potential.

The comparatively superior activity of the water-containing formulation may be explained by the enhanced extraction of hydrophilic phytoconstituents during the preparation process. In Sneha Kalpana, the addition of water facilitates the transfer of both water-soluble and lipid-soluble active compounds into the final product. Consequently, a broader spectrum of phytochemicals may become available in the

formulation, resulting in improved antimicrobial efficacy.[6]

Furthermore, the synergistic interaction of various herbal constituents present in Kushtharakshasa Taila may contribute to its inhibitory effect against microorganisms. The observed activity supports the traditional application of the formulation in dermatological conditions where microbial involvement is common.[1,5,7]

The results also suggest that the pharmaceutical method employed during preparation can significantly influence the therapeutic potential of the final formulation. Therefore, inclusion of water during Suryapaka may be considered advantageous for obtaining enhanced antimicrobial activity.

CONCLUSION

Both formulations of Suryapaki Kushtharakshasa Taila exhibited antimicrobial activity against the selected bacterial and fungal strains. However, the formulation prepared with water demonstrated comparatively greater inhibitory effects against all tested organisms. These findings indicate that the addition of water during the Suryapaka process may improve the extraction of therapeutically active constituents, thereby enhancing antimicrobial efficacy. The study provides preliminary scientific evidence supporting the traditional use of Kushtharakshasa Taila in microbial skin disorders. Further investigations involving phytochemical profiling, determination of minimum inhibitory concentration (MIC), and larger antimicrobial screening studies are recommended to substantiate these observations.

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