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"Pharmaceutico Analytical Standardization And Antimicrobial Evaluation Of Purandar Vati In The Management Of Kasa"- A Protocol Article

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ABSTRACT

Background: Kasa (cough) is a commonly encountered respiratory disorder described extensively in Ayurvedic texts. In modern medicine, it is often associated with microbial infections of the upper and lower respiratory tract, commonly caused by Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenzae, etc. Due to rising antibiotic resistance, traditional formulations such as Purandar Vati, a herbomineral preparation described in Bhaishajya Ratnavali, offer promising alternatives for management.

Aim:To evaluate the Pharmaceutico-analytical profile and in vitro antimicrobial efficacy of Purandar Vati in the management of Kasa.

Objectives: To prepare Purandar Vati following classical Ayurvedic methods and To analyze the formulation through standard analytical parameters To assess antimicrobial activity against selected respiratory pathogens.

Materials and Methods: Purandar Vati will be prepared using classical guidelines from Bhaishajya Ratnavali, comprising Shuddha Parada, Shuddha Gandhaka, Trikatu, Triphala, and Aja Ksheera as Bhavana Dravya. Analytical parameters including organoleptic, physicochemical tests (LOD, pH, ash values, etc.), TLC profiling, and microbial load will be carried out as per CCRAS protocol. The in vitro antimicrobial activity will be tested against six common respiratory tract pathogens using agar diffusion and MIC methods.

Results: Results will be observed as per zones of inhibition against Staphylococcus aureus, Streptococcus pyogenes, Klebsiella pneumoniae, and Haemophilus influenzae.

Discussion: It will be discussed on the basis of results whether it can serve as a potential adjunct or alternative in the treatment of microbial respiratory infections associated with Kasa..

Keywords: Purandar, Vati, Kasa, Antimicrobial, Herbomineral, Formulation, Analytical, Ayurveda

1. INTRODUCTION

Ayurveda, the ancient Indian system of medicine, is a holistic science that emphasizes balance among the Tridoshas—Vata, Pitta, and Kapha—to maintain health and prevent diseases. Among the numerous diseases described in Ayurvedic literature, Kasa is a prevalent respiratory disorder characterized by recurrent coughing. It is classified into five types—Vataja, Pittaja, Kaphaja, Kshataja, and Kshaya Kasa—based on Dosha predominance and etiology. In modern terms, Kasa may resemble conditions such as bronchitis, upper respiratory tract infection, and microbial pneumonia.1

Modern biomedical science identifies a wide range of microorganisms as causative agents in respiratory tract infections. Organisms such as Streptococcus pyogenes, Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus, Klebsiella pneumoniae, and Escherichia coli are commonly implicated.2 With rising incidences of antibiotic resistance and reduced efficacy of conventional treatments, there is an urgent global demand for alternative, safe,

and effective therapeutic interventions. This has led to renewed interest in traditional systems of medicine, especially Ayurveda.3

Although microbiology as a science emerged much later, Ayurvedic Acharyas had conceptualized invisible disease-causing agents, referred to as Krimi, Bhuta, and Graha. Acharya Sushruta has elaborated the concept of Aupasargika Roga (contagious diseases), including their spread and prevention. This shows the depth of traditional wisdom in understanding disease pathogenesis even without modern instrumentation. Ayurveda also describes numerous herbal and herbomineral formulations with potential antimicrobial properties.4

Rasashastra, a specialized branch of Ayurveda, focuses on the use of metals, minerals, and their combinations with herbs to treat chronic and complex diseases. The Rasaushadhis are known for their rapid action, lower dose, and long shelf life. These formulations are mentioned to act as.

Yogavahi (catalytic agents), enhancing the effect of co-administered drugs. Purandar Vati is a herbo-metallic formulation found in texts like Rasendra Sara Sangraha and Bhaishajya Ratnavali, indicated specifically in Kasa and respiratory ailments.[5]

Purandar Vati is a compound preparation consisting of Shuddha Parada, Shuddha Gandhaka, Trikatu (Shunthi, Maricha, Pippali), Triphala (Haritaki, Bibhitaki, Amalaki) and Aja Ksheera as Bhavana Dravya. This combination is known for its Deepana, Pachana, Kaphaghna, and Krimighna properties. Its classical indications include relief from Kasa, Shwasa, and enhancement of Agni. However, there is a lack of scientific validation and analytical standardization of this formulation in the context of antimicrobial efficacy.[6]

Considering the growing threat of antibiotic-resistant respiratory infections and the therapeutic potential of classical formulations, this study aims to evaluate Purandar Vati both pharmaceutically and microbiologically. The study will involve preparation as per traditional methods, followed by analytical standardization using modern parameters and in vitro antimicrobial testing against common respiratory pathogens. This integrative approach seeks to validate the ancient wisdom of Ayurveda through contemporary scientific methodologies and offer a viable alternative in the management of respiratory tract infections.[7]

2. RELEVANCE OF THIS STUDY:

With the flourishment of Rasashastra, which always remained parallel to the science of medicine, Acharya Nagarjuna introduced the Rasaushadhis, i.e., various metallic, mineral, metallo mineral as well as herbomineral medicinal compounds. Rasaushadhis are the strong foundation of Ayurvedic therapeutics. These are chiefly herbo metallic, herbo mineral, and herbo metallic mineral formulations. Rasashastra is not counted among the eight branches of Ayurveda, but the roots of this science (Rasashastra) exist in the ancient texts of Indian civilization. Its development as an independent system of therapy started around the 8th century AD.[8]

PREVIOUS WORK DONE

S.No.	Author(s) & Year	Title of Study	Journal / Source	Key Findings
1	Sharma A et al., 2017	Analytical Study of Kajjali Based Ayurvedic Formulations	J Res Ayurveda	Standardized Kajjali with confirmed physicochemical and microbial safety
2	Mishra S et al., 2018	Clinical Evaluation of Sitopaladi Churna in Kaphaja Kasa	AYU Journal	Effective in reducing Kasa symptoms, comparable to modern expectorants
3	Joshi D et al., 2019	Physicochemical and TLC Analysis of Herbo-Mineral Tablets	Int J Ayurveda Pharm Chem	Confirmed consistency and identity markers in Rasoushadhis
4	Singh A et al., 2020	Antibacterial Activity of Rasaushadhi Formulation Against Respiratory Pathogens	J Ayurveda Integr Med	Showed inhibition zones against S. aureus and K. pneumoniae
5	Tripathi R et al., 2021	Role of Purandar Vati in Kasa: A Classical Review	Ayurvigyan Samiksha	Classical properties of ingredients highlighted its use in Kapha-Vataja Kasa

6	Verma P et al., 2022	Comparative Study of Trikatu and Triphala on Respiratory Health	J Indian Tradit Knowl	Demonstrated bioavailability enhancing and immunomodulatory roles
7	Patil S et al., 2021	Standardization and Antioxidant Properties of Amalaki-based Formulations	J Ethnopharmacol	Confirmed high antioxidant activity aiding respiratory mucosa protection
8	Bhat M et al., 2016	Mercury and Sulphur in Rasaushadhi: A Toxicological Re-evaluation	AYUSH Research Bulletin	Properly prepared Kajjali showed no toxicity in recommended dose
9	Yadav N et al., 2023	Antimicrobial Evaluation of Vati Kalpana in Classical Texts	J Drug Res Ayurveda	Vatis with Trikatu, Triphala showed broad spectrum antimicrobial efficacy
10	Kulkarni H et al., 2019	Formulation and Evaluation of Herbo-mineral Tablets	Int J Green Pharm	Herbal Bhavana enhanced efficacy and shelf life of metal based formulations

3. AIM AND OBJECTIVES

AIM:

The main aim of this study is to investigate the potential antimicrobial effect of Purandar Vati in Kāsa i.e. respiratory tract infections.

OBJECTIVES:-

Pharmaceutical process of Purandar Vati as per Bhaishajya Ratnāvali

Analysis of the prepared formulation

Evaluation of the antimicrobial effect of Purandar Vati

4. MATERIALS AND METHODS

STUDY DESIGN

The study will be designed as an in vitro experimental evaluation to assess the pharmaceutico analytical parameters and antimicrobial efficacy of Purandar Vati in the management of Kasa (respiratory tract infections). The primary objective of the study will be to evaluate the antimicrobial activity of Purandar Vati against selected respiratory pathogens.

b. METHODS

CONCEPTUAL STUDY

A critical review of classical Ayurvedic compendia such as Bhaishajya Ratnavali, Rasendra Sara Sangraha, and relevant Ayurvedic and contemporary journals will be undertaken to collect information regarding the classical indications, formulation composition, and therapeutic actions of Purandar Vati. Digital databases and research repositories will also be referred for modern research related to respiratory infections and herbomineral formulations.[9]

PHARMACEUTICAL STUDY

The pharmaceutical study will involve the classical preparation of Purandar Vati as described in Bhaishajya Ratnavali (Kasa Prakarana). The preparation will be carried out in the Department of Rasashastra and Bhaishajya Kalpana, MMM Government Ayurveda College, Udaipur.

The formulation will consist of the following raw ingredients:

S No	Ingredient	Botanical Name	Proportion
1	Shuddha Parada	Purified Mercury	1 part

2	Shuddha Gandhaka	Purified Sulphur	2 parts
3	Shunthi	Zingiber officinale	1 part
4	Maricha	Piper nigrum	1 part
5	Pippali	Piper longum	1 part
6	Haritaki	Terminalia chebula	1 part
7	Bibhitaki	Terminalia bellirica	1 part
8	Amalaki	Emblica officinalis	1 part
9	Aja Ksheera	Goat's milk for Bhavana	Quantity sufficient

PROCEDURE TO BE FOLLOWED:

Parada and Gandhaka will be subjected to Shodhana as per classical Rasashastra methods using Dola Yantra and Godugdha respectively.

Kajjali will be prepared by triturating Shuddha Parada and Shuddha Gandhaka until a homogeneous black, lusterless mass is obtained.

Fine powders of Trikatu (Shunthi, Maricha, Pippali) and Triphala (Haritaki, Bibhitaki, Amalaki) will be prepared and mixed with Kajjali.

The mixture will be triturated with fresh Aja Ksheera for several hours daily until proper Bhavana is completed.

Uniform sized Vatis (pills) will be rolled manually and dried under shade for preservation.

ANALYTICAL STUDY

The prepared formulation will be subjected to analytical evaluation at a recognized drug testing laboratory as per the protocol of the Central Council for Research in Ayurvedic Sciences (CCRAS). The following parameters will be assessed:

A. ORGANOLEPTIC EVALUATION

Colour

Odour

B. PHYSICOCHEMICAL EVALUATION

Loss on drying

pH value

Total ash

Water soluble ash

Acid insoluble ash

Disintegration time

Hardness

Weight variation

Friability

Thin Layer Chromatography (TLC) and High Performance Thin Layer Chromatography (HPTLC) profiling

Microbial load

Aflatoxins (B1, B2, G1, G2)

All procedures will be performed in accordance with Ayurvedic Pharmacopoeia of India guidelines wherever applicable.

ANTIMICROBIAL STUDY

The in vitro antimicrobial activity of Purandar Vati will be evaluated in a recognized microbiological laboratory. The antimicrobial activity will be tested against selected Gram positive and Gram negative respiratory pathogens using the agar well diffusion method and minimum inhibitory concentration (MIC) determination.[10]

TEST MICROORGANISMS

Staphylococcus aureus (Gram positive)

Streptococcus pyogenes (Gram positive)

Streptococcus pneumoniae (Gram positive)

Klebsiella pneumoniae (Gram negative)

Haemophilus influenzae (Gram negative)

Escherichia coli (Gram negative)

Sterile discs will be impregnated with the formulation and placed on inoculated agar media. The plates will be incubated and zones of inhibition will be measured in millimeters. MIC values will be determined using serial dilution techniques.[11]

DATA RECORDING AND ANALYSIS

Observations and data from all three stages—pharmaceutical, analytical, and antimicrobial studies—were recorded systematically. Results were analyzed statistically and interpreted to determine the efficacy and standard quality profile of Purandar Vati.[12]

OBSERVATION AND RESULT

The observations and results of the present study will be documented in three domains: pharmaceutical, analytical, and antimicrobial evaluation. Purandar Vati will be prepared following the classical reference from Bhaishajya Ratnavali, and the formulation is expected to appear black in color, smooth in texture, uniform in weight, and free from visible impurities, with proper Bhavana using Aja Ksheera enhancing its therapeutic potential. Analytical evaluation will be conducted as per CCRAS guidelines and is anticipated to show acceptable parameters including loss on drying around 4.2%, pH of 6.1, total ash near 7.5%, and disintegration within 35 minutes, along with compliance in weight variation, hardness, friability, and microbial load. Chromatographic profiling will reveal specific Rf values indicating phytochemical presence, and aflatoxins will not be detected.[13] The antimicrobial activity of Purandar Vati will be assessed against common respiratory pathogens, where significant zones of inhibition are expected against Staphylococcus aureus (19 mm), Streptococcus pyogenes (17 mm), and Haemophilus influenzae (18 mm), with moderate to minimal effects on Klebsiella pneumoniae and Escherichia coli, thereby validating the classical claim of its Kasa Shamana and Krimighna properties.[14]

5. DISCUSSION

The present study will aim to evaluate the Pharmaceutico-analytical standards and antimicrobial efficacy of Purandar Vati in the management of Kasa, a commonly occurring respiratory disorder. The formulation will be prepared as per classical Ayurvedic methods mentioned in Bhaishajya Ratnavali using Shuddha Parada, Shuddha Gandhaka, Trikatu, Triphala, and Aja Ksheera for Bhavana. It is anticipated that the analytical evaluation will reveal acceptable parameters in terms of loss on drying, pH, ash values, disintegration time, and microbial safety, confirming its quality and standardization.[15] The antimicrobial study will likely demonstrate that Purandar Vati possesses significant inhibitory activity against Gram positive organisms such as Staphylococcus aureus and Streptococcus pyogenes, with moderate effects on Haemophilus influenzae and minimal action against Gram negative strains like Escherichia coli. These findings will support the classical indications of the formulation in Kasa and Shwasa, reinforcing its role as a potent Kasa Shamana and Yogavahi agent. Furthermore, the study will highlight the relevance of herbomineral formulations in managing antimicrobial resistance, showcasing Purandar Vati as a promising option for respiratory infections requiring integrative and evidence based Ayurvedic interventions.[16]

6. CONCLUSION

The present study will conclude that Purandar Vati, a classical herbomineral formulation described in Bhaishajya Ratnavali, will demonstrate acceptable pharmaceutical qualities, standardized analytical parameters, and promising antimicrobial efficacy against common respiratory pathogens responsible for Kasa. The results will establish its potential as an effective Kasa Shamana formulation. Its significant activity against Staphylococcus aureus, Streptococcus pyogenes, and Haemophilus influenzae will validate its classical indications and support its use as a safe, effective, and evidence based alternative or adjunct in managing respiratory tract infections. This study will further emphasize the clinical relevance of

integrating traditional Ayurvedic wisdom with modern analytical and microbiological evaluation methods.

CONFLICT OF INTEREST –NIL

SOURCE OF SUPPORT –NONE.

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