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IN VITRO ANTIBACTERIAL ACTIVITY OF *MUSTADI YOG*

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ABSTRACT

In the present study the attempt was made to evaluate antibacterial properties of the Mustadi Yog which contains *Musta*, *Pippali*, *Ativisha*, *Karkatshringi* and *Vasa*. All these drugs have been described to have anti-cough properties and anti-microbial properties in different texts. The least extract concentration which inhibited the growth of the test organisms was taken as Minimum Iinhibitory Concentration (MIC). Among all the test organisms, *Proteus* Spp. and *Pseudomonas aeruginosa* were highly sensitive with alcoholic extracts of all the drugs while Staphylococcus aureus was highly sensitive with alcoholic extract of *Musta*, *Pippali*, *Ativisha*, *Karkatshringi* and *Vasa*. *Salmonella* Typhi was sensitive to only *Musta and Pippali.*

KEYWORDS: *Musta*, *Pippali*, *Ativisha*, *Karkatshringi* and *Vasa*.

INTRODUCTION

Micro-organisms have developed resistance to many antibiotics and this have created immense clinical problem in the treatment of infectious disease.[1] This resistance has increased due to indiscriminate use of commercial anti-microbial drugs commonly used in the treatment of infectious disease. This situation has forced scientists to search for new antimicrobial substances molecules from various sources, such as medicinal plants.[2] Infection is considered as one of the main factors responsible for Cough in children. Secondary metabolites produced by plants constitute a source of bioactive substances and nowadays the scientific interest has increased for new drugs of plant origin.

The developing countries dependent on traditional medicine for variety of diseases.[3] In the last two decades, there has been increased interest in investigation of natural products as source of new antibacterial agents. Several experimental studies have contributed scientific evidence for the pharmacological effects of medicinal plants observed in folk medicine.[4] As cough is the most frequent symptom of respiratory diseases[5] in which majority patients having recurrent cough as the manifestation of recurrent respiratory disease. While reviewing of latest Government data, in the last decade, year by year mortality rate due to diseases of respiratory system is increasing[6] It was 4.3% in year 2002, 5.7% in 2006, 9.5 % in 2009 and reached to 10.6% in year 2010.[7]

In classics, descriptions of disease *Kasa* clearly correlate with cough and its Pathophysiology exactly correlates with the mechanism of cough reflex.[8] *Mustadi Yog* is described in *Yoga Ratnakar* under *Balarogadhikar* and it is indicated in *Kasa.*[9] The ingredients of *Mustadi Yog* are *Musta (Cyperus rotundus* L.*), Ativisha(Aconitum heterophyllum* Wall. Cat.*), Vasa (Adhatoda vasica Nees), Pippali (Piper longum* L.) and *Karkatshringi (Pistacia integerrima* Stewart ex Brandis).

MATERIALS AND METHOD

Plant Materials

The drug was collected from Haridwar, Uttarakhand. The plant was identified and authenticated by the Department of Botany, Banaras Hindu University, Varanasi.

Preparation of Extracts

For the study dry extract of each drug was prepared in the laboratory of the Department of Medicinal Chemistry, Banaras Hindu University, Varanasi. Alcoholic extract was prepared by Soxhlet method of extraction. It was collected in separate sterile vials and preserved at 4^0C temperature. Anti-microbial susceptibility testing was carried out by-1. Dilution method 2. Diffusion method. Diffusion method was done by two methods I. Stoke's method II. Kirby – Bauer method. In routine laboratory modified Kirby-Bauer method was used as suggested by NCCLS (National Committee for Clinical Laboratory Services), USA, 2000.

Test organisms

The bacterial strains *Proteus Spp., Staphylococcus aureus, Pseudomonas aeruginosa, Salmonella Typhi Streptococcus pneumonia M. pneumoniae* were obtained from the

department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India.

Procedures

M.H.A. plate taken and particular organism grown on plate:

- Bacterial Lawn made on plate (0.5 OD)($1.5x10^8$ cfu/ml)
- Alcoholic extract prepared as; 80mg dry extract dissolved in 1ml methanol.
- Alcoholic extract to be placed on the plate, disc diffusion method used.
- Then incubated over night at 37^0C.

Determination of minimum inhibitory concentration (MIC)

The MIC of active extracts was determined by tube dilution method. Successive tubes filled with 15 ml nutrient broth containing 1000µg/ml, 500µg/ml, and 250µg/ml up to 31.75µg/ml respective concentrations of extracts were inoculated with 100µl of the bacterial suspension containing 108 CFU/ml of respective test organisms. The tubes were incubated at 37ºC in an incubator and observed for change in turbidity after 24 h. A tube containing nutrient broth without extract was taken as control. The least extract concentration which inhibited the growth of the test organisms was taken as MIC.

RESULTS AND DISCUSSSION

Minimum Inhibitory Concentration of alcoholic extracts of contents in Mustadi Yog.(in µg/ml)

	Proteus Spp	***Pseudomonas aeruginosa***	***Staphylococcus aureus***	***Salmonella* Typhi**
Musta	35.156	8.789	1125	17.578
Pippali	2156.25	134.76	34500	2156.25
Ativisha	625	9.766	_	_
Karkatshringi	105.468	6.592	1687.5	_
Vasa	14.648	7.324	3.662	_

Proteus spp. was found sensitive to alcoholic extract of *Musta, Pippali, Ativisha, Karkatshringi* and *Vasa*. *Pseudomonas* was found sensitive to alcoholic extract of *Musta, Pippali, Ativisha, Karkatshringi* and *Vasa Staphylococcus aureus* found sensitive to alcoholic extract of *Musta, Pippali, Karkatshringi and Vasa*. *Salmonella* Typhi was found sensitive to both extract of *Musta, Pippali*.

This result suggests the presence of an active principle with good antibacterial potency or a high concentration of a moderately active principle in the extract. This antibacterial activity would support the folk therapy of infections and traditional therapeutic claims of this preparation.

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