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ANTIMICROBIAL PROPERTIES OF DUSHIVISHARI AGAD AND ITS INGREDIENTS: AN OVERVIEW

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ABSTRACT

Dushivishari Agad is used in medicinal preparation since long ago. The present study was taken to investigate the *in vitro* antimicrobial of this formulation. Agar-disc diffusion method was used for *in vitro* antimimicrobial screening. Zones of inhibition were observed in disc diffusion for antimicrobial investigation against selected standard bacterial strains. The formulation – '*Dushivishari Agad*' showed average zone of inhibition ranging from 2-7 mm suggesting its activeness against the tested microorganisms. In this present study *Dushivishari Agad* has been checked against Cefpodoxime for their antimicrobial activity. So that further will reveal more importance in medicinal preparations. It will differentiate that which drug should have a better result in terms of antimicrobial activity.

INTRODUCTION

Agadtantra deals with study of various toxins & *Dushivisha* is one of the very important concepts explained. *Dushivisha* term indicates something which gets accumulated inside the body & causing ill health effects after sometime.

Diagnosis of the diseases can be done by Biochemistry, Microbiology and pathology in medical science. They help the clinicians or late diagnosis and failure in the treatment leads to death, Acharya Charaka in Indian Medical Science has given three sutras or basic pillars as Hetu (Causes), Linga(Symptoms) and Aushadha (Medicine), in which Aushadha have unique importance. In this modern era Aushadha i.e, Ayurvedic drugs are to be tested in the light of

modern scientific techniques. But the need of the hour is to provide clear cut evidence to show the effectiveness of the Ayurvedic drug in a disease by Laboratory findings. By employing Microbiological analytical techniques for assessing the severity and type of disease an Ayurvedic physician can easily choose the drug and try to evaluate its effectiveness specifically to the particular disease, by which specificity of the drug can be attained.

The Ayurvedic approach to the prevention and treatment of microbial infection recognizes the emergency use of modern drugs, but recommends traditional herbal combinations and extracts known to balance the individual and improve health, as well as herbs that help to combat or prevent microbial infections.

Dushivishari Agad is mentioned in *Ashtanga Hridaya*m Uttarsthana chapter 35/39.comprises the effect in *Dushivisha* & various poisonous conditions. So it is very much essential to evaluate the effects of this compound preparation against certain microbes. Present study highlights the results of contents of *Dushivishari Agad* analysed as potential antimicrobial in the form of compound drug as well as a source for natural compounds that act as new anti-infection agents.

AIM AND OBJECTIVES

The aim of this study was to evaluate the antimicrobial activity of compound herbal preparation, '*Dushivishari Agad'*.

To evaluate anti-microbial activity of *Dushivishari Agad* on standard bacterial strains.

MATERIALS AND METHODS

Dushivishari agad

Dushivishari Agad is a Herbo-mineral formulation described in *Ashtanga Hridya* in *Uttarsthana(35/39)* in *Vishapratishedha adhyaya* under treatment of *Dushivisha*.

Detailed description of drug is as follows:

Table no. 1: Ingredients of dushivishari agad.

Sr. no.	Drug name	Latin name	Parts
01	Pippali	*Piper longum* Linn.	01
02	Dhyamaka(Rohisha)	*Cymbopogan martini Roxb.*	01
03	Mansi	*Nordostachys jatamansi DC*	01
04	Rodhra	*Symplocos racemosa Roxb.*	01

05	Ela	*Elettaria cardamomum Maton*	01
06	Kutanata(Shonyak)	*Oroxylum indicum Vent.*	01
07	Nata(Tagar)	*Valeriana wallichii DC*	01
08	Kustha	*Saussurea lappa C.B.Clarke*	01
09	Yasti	*Glycyrrhiza glabra Linn.*	01
10	Chandana	*Santalum album Linn.*	01
11	Suvarchika	Mixture of Potassium salts	01
12	Shudha Gairika	*Red Ochre*	01

***Oroxylum indicum* - Stem & Bark**

***Symplocos racemosa* – Stem**

***Piper longum* – Fruit**

***Valeriana walllichi* - Root**

***Santalum album* – Heart wood**

Suvarchika

Shudha Gairik

***Nordostachys jatamansi* - Root**

***Cymbopogan martini* – Whole plant**

***Saussurea lappa*- Root**

***Glycyrrhiza glabra* - Root**

***Elettaria cadramomum* - Fruit**

Fig. no. 1: Raw drugs of *dushivishari agad.*

Fig. no. 2: 12 Drugs churna of *dushivishari agad.*

Fig. no. 3: Preparation of *dushivishari agad.*

Plan of study

The antimicrobial activity was assessed qualitatively and quantitatively by the presence or absence of inhibition zones. Micro-organisms strains of *E. coli*, *Bacillus subtilis*, *Staphylococcus aureus*, *Salmonella typhi* were used for assessing the antimicrobial activity with standard Cefpodoxime (50 and 100 mg /1 and 2 ml respectively).

Preparation of extract

Methanol and ethanol was used for preparation of extracts required for the study.

Extract preparations

1. Methanol extract

50 gm of dried churna of *Dushivishari Agad* were taken in a separate container to this 250 ml of methanol was added and kept for 24 hrs with periodic shaking (Rotary shaker) then filtered and the filtrate was collected. The procedure was repeated three times with fresh volume of methanol. The filtrates were pooled.

2. Ethanol extract

50 gm of dried churna of *Dushivishari Agad* were taken in a separate container, to this 250ml of ethanol was added and kept for 24 hrs with periodic shaking (Rotary shaker) then filtered and filtrate was collected, the procedure was repeated three times with fresh volume of ethanol. The collected filtrates were polled.

Fig. no. 4: Extract preparation of *dushivishari agad.*

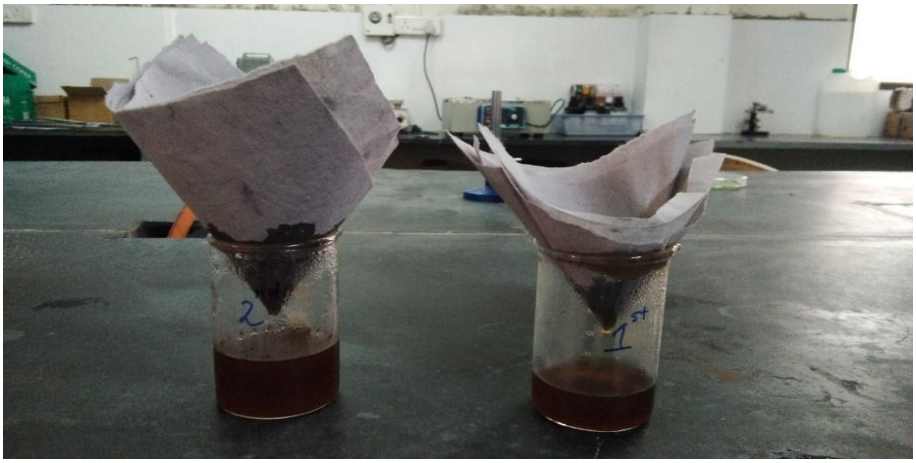


Fig. no. 5: Methanol and Ethanol extract.

METHOD

Antimicrobial activity will be determined by Agar disc diffusion method. Muller Hinton was used as medium for bacterial strains.

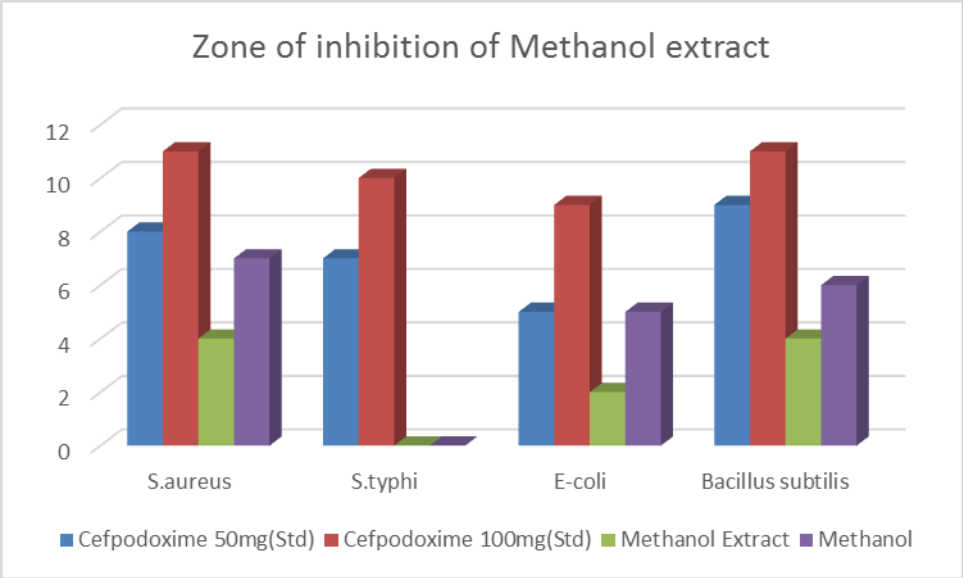
The sterile cotton was inserted into the bacterial suspension and then rotated and compressed against the wall of the test tube so as to express the excess fluid. The surface of Muller Hinton Agar plate was inoculated with the swab. To ensure that the growth is uniform and confluent (or semi confluent) the swab is passed three times over the entire surface, by repeating the procedure, taking care the second and third time to turn the plate through 60°. *Dushivishari Agad* churna extracts were prepared using Dimethylsulfoxide: Methanol (1:1) solvent to dissolve the plant extract. Then disc placed on the inoculated agar surface using sterile forceps. Standard disc of Cefpodoxime, 6 mm in diameter was used as positive control

and the solvent used for preparing extract was used as negative control. The plates were incubated overnight at 37°C for 18-24 hours. Antimicrobial activity was evaluated by measuring zone of inhibition by using Hi Media zone scale or measuring scale.

OBSERVATIONS AND RESULTS

Table 2: Invitro activity of *dushivishari agad* in methanol extract against opportunistic pathogens.

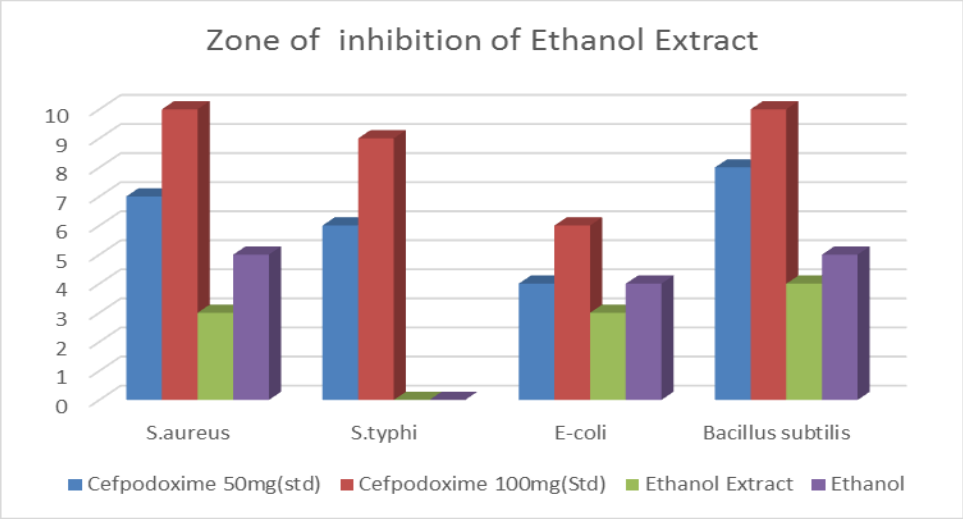
S. no.	Name of the Organism	Cefpodoxime 50mg(Std)	Cefpodoxime 100mg(Std)	Methanol Extract 1ml	Methanol Extract 2ml
1	*S.aureus*	8mm	11mm	4mm	7mm
2	*S.typhi*	7mm	10mm	-	-
3	*E-coli*	5mm	9mm	2mm	5mm
4	*Bacillus subtilis*	9mm	11mm	4mm	6mm



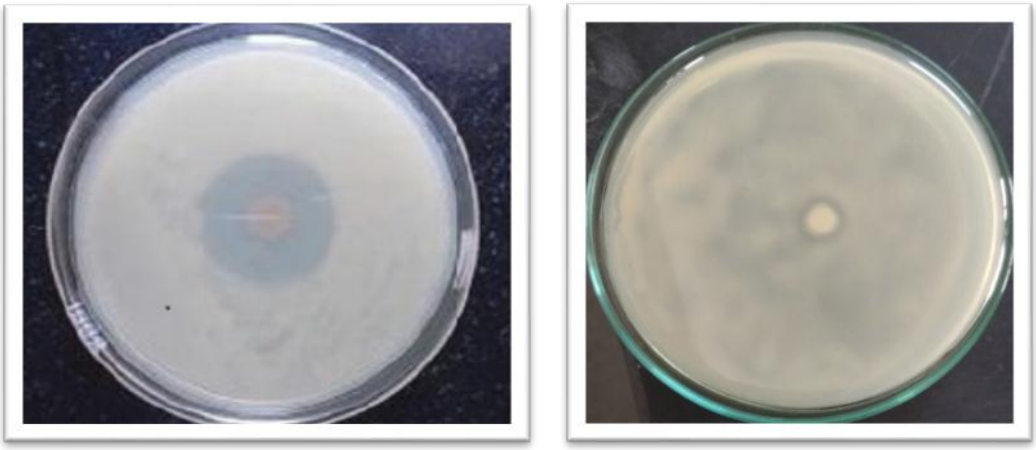
Graph 1: Showing the Bacterial strains tested with 50mg Cefpodoxime, 100mg Cefpodoxime and Methanol extract.

Table 3: Invitro activity of *dushivishari agad* in ethanol extract against opportunistic pathogens.

S. no	Name of the Organism	Cefpodoxime 50mg (std)	Cefpodoxime 100mg (Std)	Ethanol Extract 1ml	Ethanol Extract 2ml
1	*S.aureus*	7mm	10mm	3mm	5mm
2	*S.typhi*	6mm	9mm	-	-
3	*E-coli*	4mm	6mm	3mm	4mm
4	*Bacillus Subtilis*	8mm	10mm	4mm	5mm

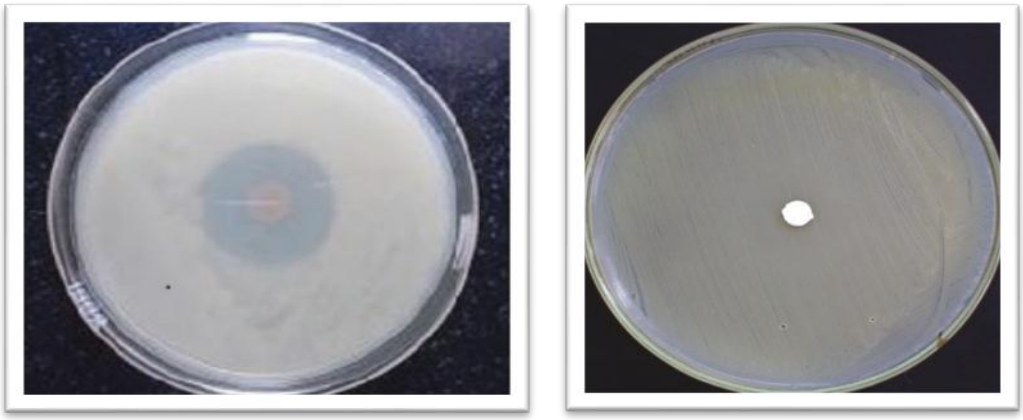


Graph 2: Showing the bacterial strains tested with 50mg Cefpodoxime, 100mg Cefpodoxime and Ethanol extract.



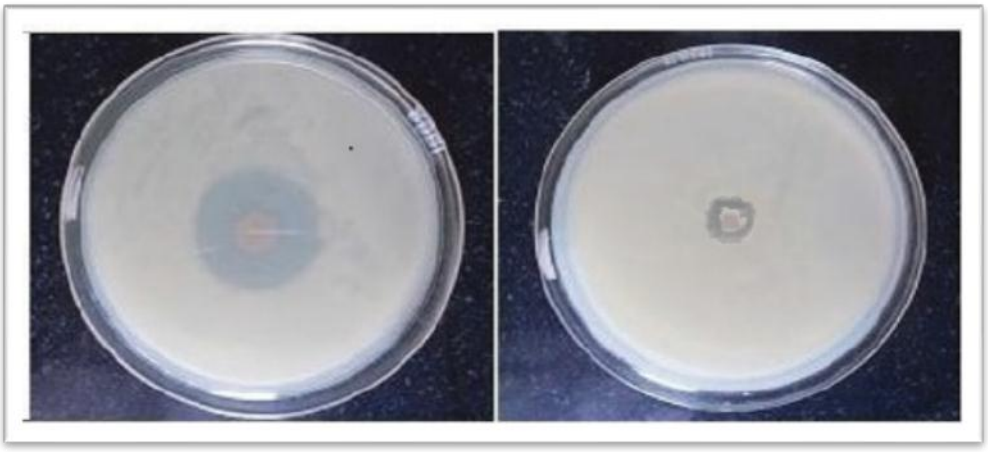
Cefpodoxime (100mg) *Dushivishari Agad* (extract 2ml)

Fig. no. 6: Zone of inhibition of *S.aureus* at higher concentrations.



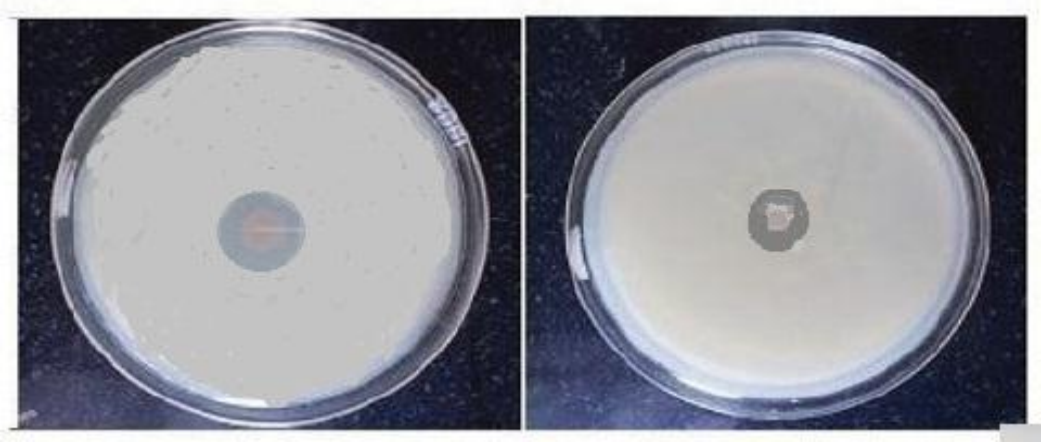
Cefpodoxime (100mg) *Dushivishari Agad* (extract 2ml)

Fig. no. 7: Zone of inhibition of *S.typhi* at higher concentrations.



Cefpodoxime (100ml) *Dushivishari Agad* (extract 2ml)

Fig. no. 8: Zone of inhibition of *E-coli* at higher concentrations.



Cefpodoxime (100 mg) *Dushivishari Agad* (extract 2ml)

Fig. no. 9: Zone of inhibition of *bacillus subtilis* at higher concentrations.

RESULTS

The potential sensitivity of *Dushivishari agad* was obtained against all the microorganisms tested as zone of inhibition. The final results are based on the measurement of mean diameter of inhibition zone formed on the completion of study.

DISCUSSION ON OBSERVATIONS AND RESULTS

The results of the present project are found to be very encouraging in case of antimicrobial activity against all the four organisms selected for study when analyzed by Disk diffusion method. These results suggest that antimicrobial activity of *Dushivishari Agad* is showing good results against these bacteria's except *Salmonella typhi*, and with comparison of standard drug Cefpodoxime shows more better results than *Dushivishari Agad*. Cefpodoxime is having good sensitivity i.e. it shows good zone of inhibition against test bacteria while

Dushivishari Agad is showing less activity as compared to zone of inhibition of Cefpodoxime. This effect is achieved by the 'Vishaghna' action of the drug content like *Jatamansi, Rodhra, Ela, Yasti, Chandana, Kustha.*

From zone of inhibition of methanol and ethanol extracts observations were taken.

CONCLUSION

- *Dushivishari Agad* shows antimicrobial activity against *S.aureus, Bacillus subtilis, E-coli.*
- *Dushivishari Agad* does not show antimicrobial activity against *Salmonella typhi.*

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