

AN ANTIFUNGAL AND ANTIMICROBIAL ASSAY ON DIFFERENT PART OF SHAMI  
(PROSOPIS CINERARIA L. DRUCE)Dr. Sangeeta Verma, (B. A. M. S., M.D.)\*<sup>1</sup> and Dr. Vipin Kumar Saraswat, (B. A. M. S., M. D.)<sup>2</sup><sup>1</sup>Medical Officer, State Ayurvedic Dispensary, Runkata, Agra.<sup>2</sup>Medical Officer, State Ayurvedic Dispensary, Lohvan, Mathura.**\*Corresponding Author: Dr. Sangeeta Verma, (B. A. M. S., M.D.)**  
Medical Officer, State Ayurvedic Dispensary, Runkata, Agra.

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## ABSTRACT

*Ayurveda* is a holistic system of medicine which in one aspect deals with disease occurring in human body and in other aspect emphasizes on the stable health of human body. There is an abundant material available regarding *Krimi* in vedic literature like *Atharva-veda*. Along with *Vata*, *Pitta* and *Kapha krimi* also have an important role in producing disease. The possibility of spread of some diseases from one individual to another has been recognized since the time immemorial, human plague and its association with rats is mentioned in "*Bhagavata purana*". As per *charaka samhita* "*Bhutabhisanga*" is also responsible factor to cause diseases. One of the three major divisions of diseases i.e. "*Agantuja vyadhis*" are caused also due to *Krimi*. Keeping on the view of the above mentioned problem, the study was carried out on plant "*Prosopis cineraria L. Druce*" (*Shami*) in order to explore its antimicrobial activity based on reference mentioned in *Bhavprakash Nighantu*.

**KEYWORDS:** *Ayurveda*, *Krimi*, *Bhutabhisanga*, *Agantuja vyadhis*.

## INTRODUCTION

*Ayurveda* is a holistic system of medicine which in one aspect deals with disease occurring in human body and in other aspect emphasizes on the stable health of human body.

There is an abundant material available regarding *Krimi* in vedic literature like *Atharva-veda*. Along with *Vata*, *Pitta* and *Kapha krimi* also have an important role in producing disease.

Infectious disease makes a trouble for human being. In order to avoid different infection there are lot of antibiotics which are derived from the microbial sources in synthetic manner. However all synthetic antimicrobial agent are locally irritant and are responsible for hypersensitivity reaction. Second important things are that antimicrobial source have become ineffective and the infectious organism develop resistance against them.

The word "*Krimi*" has described very efficiently in *Ayurvedic* literature. Abundant material regarding *krimi* is available in *Atharvaveda*. At that time, Indian physicians were well aware of the presence of micro – organisms and it could be traced to the well codified descriptions. The word "*krimi*" was used in a broad sense in *Ayurvedic* literature i.e. it includes all the pathogenic and non-pathogenic organisms covering a wide range of

infection and infestation caused by a host of agent ranging from viruses to worms. As per *charaka samhita* "*Bhutabhisanga*"<sup>[2]</sup> is also responsible factor to cause diseases. One of the three major divisions of diseases i.e. "*Agantuja vyadhis*" are due to *Krimi*.<sup>[3]</sup>

Keeping on the view of the above mentioned problem, the study was carried out on plant "*Prosopis cineraria L. Druce*" (*Shami*) in order to explore its antimicrobial activity based on reference mentioned in *Bhavprakash Nighantu*-

zml itKta kqu> zlta k;aya recnl l"u, k)kasæmñasku:QazR> k&imijtSm&ta<sup>[4]</sup>.

It has bipinnately compound leaves, alternate in arrangement. The leaflets are 15-18 pairs, and shaped oblong with an entire margin, apiculate apex, obtuse base, glabrous surface, reticulate venation, petiolate, and the petiole is 0.5-4 cm long. The average leaf size is 2.5 cm (length) and 1 cm (breadth). Fresh leaves are green in colour, and are odorless with a bitter taste.

## MATERIAL AND METHODS

## Plant material

*Prosopis cineraria L. Druce* was collected from Jhamdoli, Jaipur in May 2012. The plant material was identified and authenticated from botany department of Rajasthan University with the identification no.

RUBL211893. After the collection of plant material they were cut in to small pieces and shade dried.

### Preparation of extract

For the aqueous extraction of plant material the 'hot extraction method' was used recommended by W.H.O. (Quality control methods for medicinal plant materials). Coarsely powdered air dried drug material is accurately weighed and taken in a glass stopper conical flask. Solvent is added to the flask and the flask is attached to a reflux condenser and boiled for 6hrs, on water bath. After 6hrs, the flask is allowed to cool and the content is filtered through filter paper. The filtrate is transferred to a pre-weighed flat bottomed dish and evaporated to dryness on a water bath. Then the dish is kept in oven for six hours for the contents to get dried fully. The dish is

cooled by keeping in a desiccator for 30 minutes and weighed without delay. The residual mass remained in filter paper is dried as such and is collected fully. This mass is again put into the conical flask and added with next solvent according to polarity, and fitted with reflux condenser, and extract is prepared in the same method used above. This procedure is repeated with all the seven solvents.

Antimicrobial activity, aqueous extract of different part of *Prosopis cineraria* was prepared and test on different species of common pathogens which are responsible for various skin disorder. Bacteria are used in the study is MDR expect *Pseudomonas aeruginosa*. Bacteria are resistance to cephotaxime, ceftazidime and ceftriaxone.

**Table no. 1: Pathogen and media are selected for study as mentioned in table given below.**

Sr. No	Bacteria	Media used	Bacteria type
1.	<i>Streptococcus pyogenes</i>	Muller-Hinton agar	MDR
2.	<i>Staphylococcus aureus</i>	Muller-Hinton agar	MDR
3.	<i>Pseudomonas aeruginosa</i>	Muller-Hinton agar	ATCC27853
4.	<i>Trichophyton rubrum</i>	Sabroud's dextrose agar	MDR
5.	<i>Candida albicans</i>	Sabroud's dextrose agar	MDR

The antimicrobial study was done at Dr. B. Lal Institute of Biotechnology, Jaipur.

### ANTIMICROBIAL ASSAY

Antimicrobial assay was performed by Kirby-Bauer and Stokes Methods. Muller-Hinton agar medium is the only susceptibility test medium that has been validated by NCCLS. Mueller-Hinton agar should always be used for disk diffusion susceptibility testing, according. Water (negative control) did not show any activity against test organism. Streptomycin (5mg(w/v) per well) serves as a positive control for bacteria. Itraconazole (5mg(w/v) per well) serves as a positive control for fungi.

- ❖ Zone of inhibition- 13-18mm: sample is bioactive  
<13mm: sample is inactive  
>18mm: sample is active

### OBSERVATION AND RESULT OF ANTIMICROBIAL STUDY

Antimicrobial sensitivity was performed for different part of *Prosopis cineraria* L. Druce on Mullar Hinton agar against *Pseudomonas aeruginosa*, *Streptococcus pyogenes*, *Staphylococcus aureus* and *candida ablicans*, *trichophyton rubrum* by well diffusion method, following were the result obtained using Streptomycin [5mg(w/v)] as antibiotic/ itraconazole as antifungal as positive control and water as negative control. Sample is also taken as 5 mg/well (w/v) in concentration.

Antifungal sensitivity test of *Prosopis cineraria* L. Druce – Itraconazole as positive control

**Table no.2: Result of *Prosopis cineraria* L. Druce on *Candida ablicans*.**

PLANT PART	P.C. Z.O.I. (MM)	SAMPLE Z.O.I. (MM)			MEAN
		Z.O.I.1	Z.O.I.2	Z.O.I.3	
<b>Fruit</b>	22.5	15	16	15.5	15.5
<b>Resin</b>	22.5	18	15.5	16	16.5
<b>Leaf</b>	22.5	15.5	18	17.5	17
<b>Root bark</b>	22.5	12	12.5	12	12.16
<b>Stem bark</b>	22.5	15.5	16.6	17.5	16.5

Result of different part of *Prosopis cineraria* L. Druce on *Candida ablicans* shows following conclusion-

- ❖ All part of *Prosopis cineraria* L.Druce is bio-active on *candida ablicans* but leaf is more bio-active on *Candida ablicans* as compare to other part.

**Table no.3: Result of Prosopis cineraria L. Druce on Trichyophyton ruburum.**

Plant Part	P.C. Z.O.I. (MM)	SAMPLE Z.O.I.(MM)			MEAN
		Z.O.I. 1	Z.O.I. 2	Z.O.I. 3	
<b>Fruit</b>	35.6	17	16.5	16	16.5
<b>Resin</b>	35.6	18	20.5	19	19.16
<b>Leaf</b>	35.6	18.5	18	18	18.16
<b>Root bark</b>	35.6	11	11.5	12	11.5
<b>Stem bark</b>	35.6	14.5	14	14.5	14.33

Result of different part of Prosopis cineraria L. Druce on Trichyophyton ruburum shows following conclusion-

- ❖ All part of Prosopis cineraria L.Druce is bio-active on Trichyophyton ruburum but leaf and resin are

active on Trichyophyton ruburum.

Antibacterial sensitivity test of Prosopis cineraria L. Druce – Streptomycin as positive control

**Table no.4: Result of Prosopis cineraria L. Druce on Streptococcus pyrogenus.**

Plant Part	P.C. Z.O.I. (MM)	SAMPLE Z.O.I. (MM)			MEAN
		Z.O.I. 1	Z.O.I. 2	Z.O.I. 3	
<b>Fruit</b>	35.6	17	16.5	16	16.5
<b>Resin</b>	35.6	18	20.5	19	19.16
<b>Leaf</b>	35.6	18.5	18	18	18.16
<b>Root bark</b>	35.6	11	11.5	12	11.5
<b>Stem bark</b>	35.6	14.5	14	14.5	14.33

Result of different part of Prosopis cineraria L. Druce on Streptococcus pyrogenus shows following conclusion-

- ❖ Resin & leaf is active on streptococcus pyrogenus.

- ❖ Fruit & stem bark is bio-active on streptococcus pyrogenus.

- ❖ Root bark is inactive on streptococcus pyrogenus.

**Table no.5: Result of Prosopis cineraria L. Druce on Pseudomonas asaeruginosa.**

Plant Part	P.C. Z.O.I. (MM)	SAMPLE Z.O.I. (MM)			MEAN
		Z.O.I. 1	Z.O.I. 2	Z.O.I. 3	
<b>Fruit</b>	38.5	14	14.5	14	14.14
<b>Resin</b>	38.5	13	13.5	14	13.5
<b>Leaf</b>	38.5	16	17.5	17	16.66
<b>Root bark</b>	38.5	13	13.5	14	13.5
<b>Stem bark</b>	38.5	13.5	0	15	15.16

Result of different part of Prosopis cineraria L. Druce on Pseudomonas aeruginosa shows following conclusion-

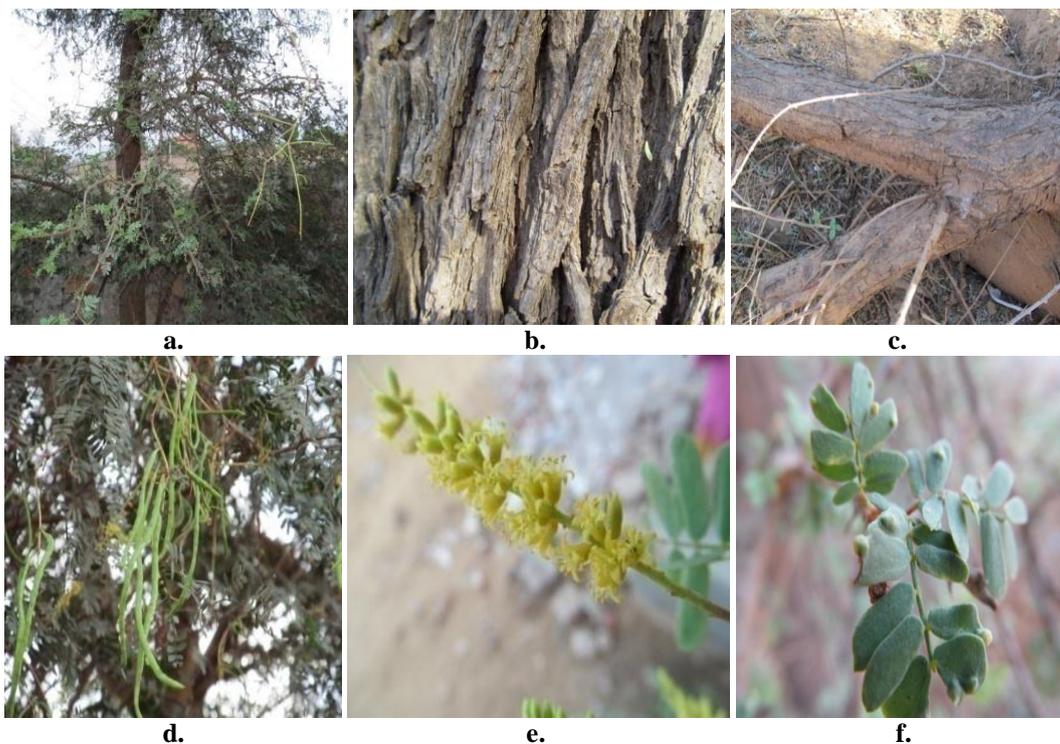
- ❖ All part of Prosopis cineraria L.Druce is bio-active on Pseudomonas aeruginosa.

**Table no.6: Result of Prosopis cineraria L. Druce on Staphylococcus aureus.**

Plant Part	P.C. Z.O.I. (MM)	Sample Z.O.I. (MM)			MEAN
		Z.O.I.1	Z.O.I.2	Z.O.I.3	
<b>Fruit</b>	44	0	0	0	0
<b>Resin</b>	44	19	19.5	20	19.5
<b>Leaf</b>	44	14.5	17	17	16.16
<b>Root bark</b>	44	12	12.5	13	12.5
<b>Stem bark</b>	44	12	12.5	14.5	12.83

Result of different part of Prosopis cineraria L. Druce on Staphylococcus aureus shows following conclusion-

- ❖ Resin of Prosopis cineraria L.Druce is active on Staphylococcus aureus.
- ❖ Leaf, root bark and stem bark of Prosopis cineraria L.Druce is bio-active on Staphylococcus aureus.
- ❖ Fruit of Prosopis cineraria L.Druce have no effect on Staphylococcus aureus.



A – plant of shami, b- bark of shami, c- root of shami, d- fruit of shami, e- flower of shami, f- leaf of shami  
 Figure showing different part of *Prosopis cineraria L. Druce*.

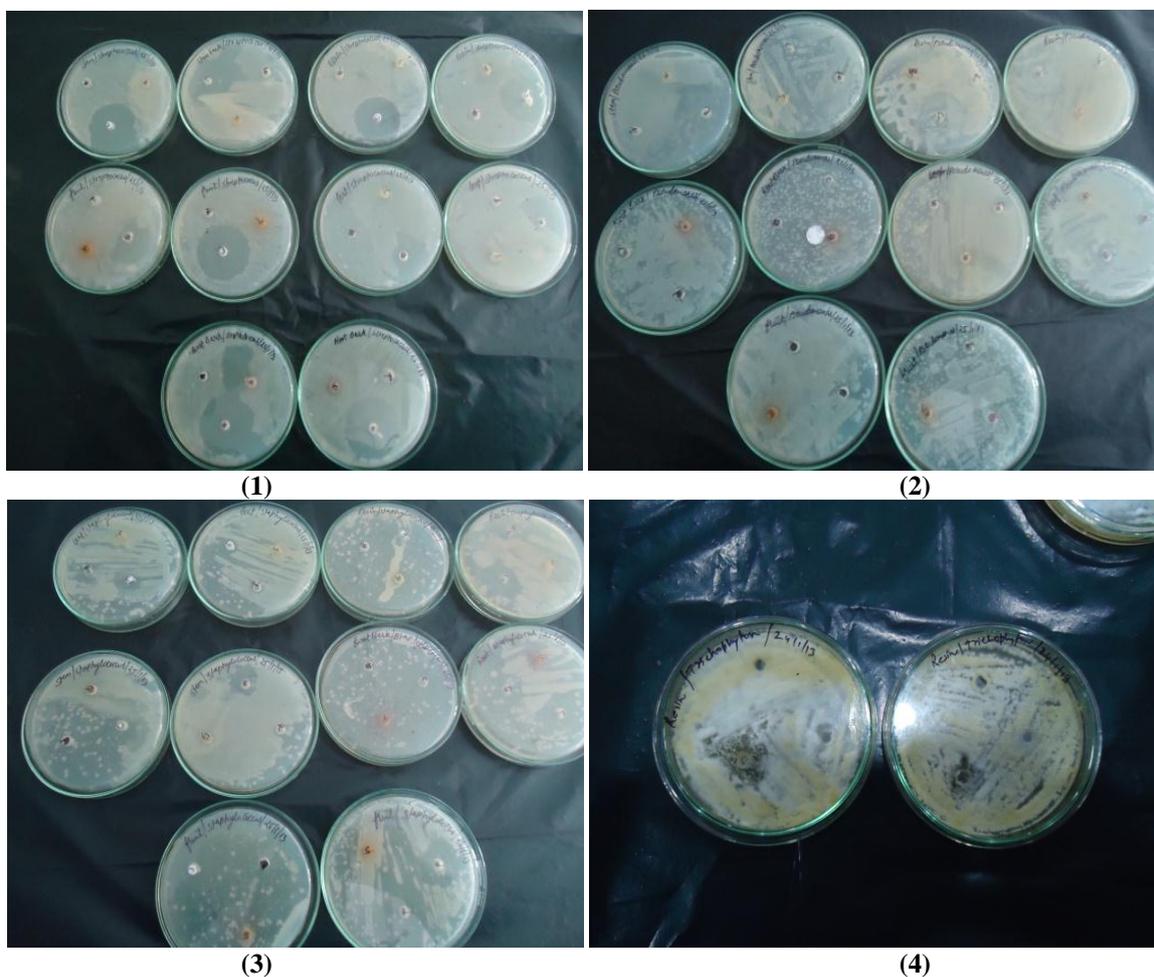


Figure (1-4): Showing antimicrobial activity.

**ACKNOWLEDGEMENT**

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