



ANTIBACTERIAL ACTIVITY OF *GYMNEMA SYLVESTRE* HYDROALCOHOLIC LEAF EXTRACT.

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ABSTRACT

To investigate the antibacterial activity of hydroalcoholic extract of leaves of *Gymnema sylvestre*. The antibacterial activity was evaluated by agar well diffusion method against gram negative (*Escherichia coli*, *Pseudomonas aeruginosa*) and gram positive bacteria (*Staphylococcus aureus*) at various concentrations. The results of the present study suggest that leaf extract of *Gymnema sylvestre* can be used for treating infectious diseases caused by *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*.

Keywords: *Gymnema sylvestre*, Hydroalcoholic extract, Antibacterial activity, Minimum inhibitory concentration.

INTRODUCTION

Gymnema sylvestre commonly known as Gudmar is a medicinally important branched woody climber, found in India. The plant is very popular for its distinctive property of temporarily destroying the taste of sweetness. In concern of drawbacks of conventional medicine, nowadays the use of natural products as an alternate to treat various diseases¹. About 80% of individuals from developed countries derived from medicinal plants². Therefore, such plants should investigate for a search of new potents antibacterial compounds.

The plant reported to treat various ailments such as stimulant, diuretic, cough, stomachic and sore eyes^{3,4}. Pharmacological studies have shown that *Gymnema sylvestre* possesses antimicrobial effects^{5,6}. The aim of the present study is to investigate the antibacterial activity of hydroalcoholic leaf extract of *Gymnema sylvestre*.

MATERIAL AND METHODS

The present study was done in the department of Chemistry P.M.B Gujarati Science College, Indore. The leaves of *Gymnema sylvestre* were collected from Government Agriculture College, Indore (M.P).

CHEMICALS, MEDIA, ANTIBIOTIC

The organic solvents were obtained from Merck, India. Nutrient agar and antibacterial agents were obtained from Hi-media, Mumbai, India.

TEST ORGANISMS

Three human pathogenic bacteria were selected for antibacterial activity and include gram negative *e.coli* (ATCC2065), *pseudomonas aeruginosa* (MTCC741), *staphylococcus aureus* (ATCC6538). All microbial strains were pure isolates obtained from Institute of Microbial Technology Chandigarh, India and were maintained in nutrient agar.

EXTRACTION PROCEDURE

Leaves of *Gymnema sylvestre* was washed thoroughly under running tap water, dried and then shade and finally crushed to fine powder in mixture grinder. A quantity of plant sample 100 gm were weighed. The plant material was extracted with hydroalcoholic solvent (1:1) with soxhlet process with the help of soxhlet apparatus. After extraction excess solvent was then evaporated in water bath at 50-100 °C to obtain the crude for antioxidant assay, phytochemical and antimicrobial susceptibility.

ANTIMICROBIAL ACTIVITY

The antimicrobial activity was determined by using agar well diffusion technique ⁷. Minimum inhibitory concentration (MIC) was determined by broth dilution method ⁸. Different concentration of hydroalcoholic leaf extract was tested separately for each bacterium and inhibition growth in the plates containing test solutions was observed by comparison with blank control plates.

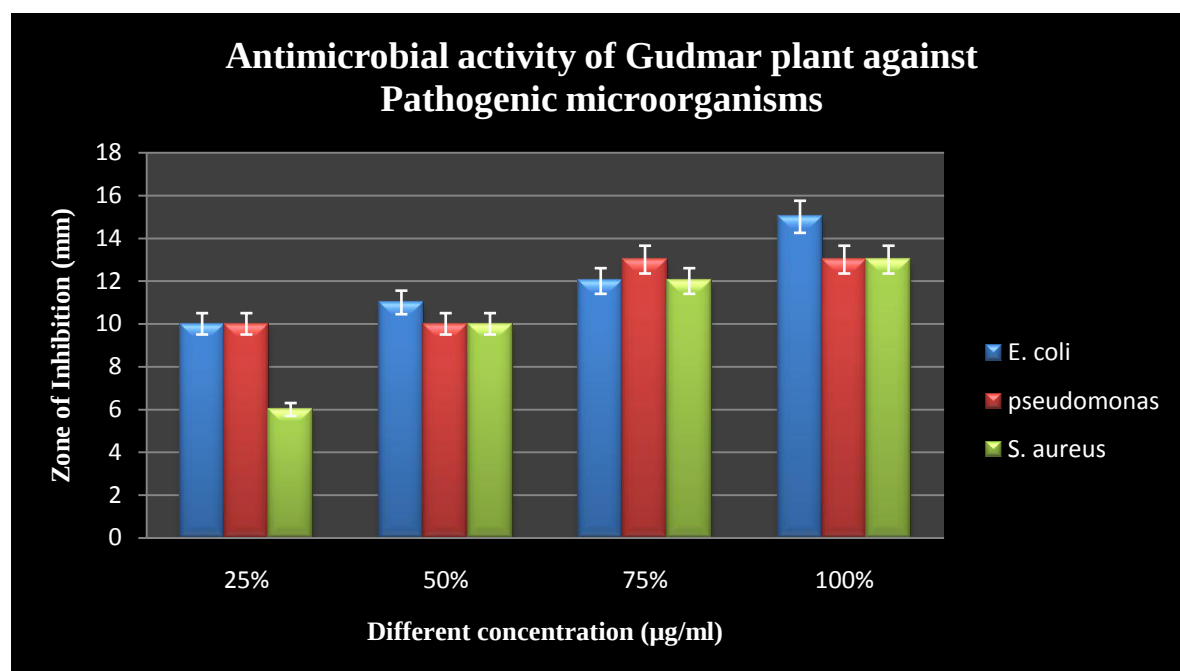
MIC is defined as the lowest concentration of test samples that result in a complete inhibition of visible growth.

RESULT AND DISCUSSION

The inhibition zones and MIC values of hydroalcoholic leaf extract of *Gymnema sylvestre* are presented in table no. 1. From the table it is observed that the zone of inhibition for *E.coli*, *Pseudomonas* and *S.aureus* is maximum at higher concentrations.

Table no.1 Gudmar Plant Antimicrobial Activity with Pathogenic Microorganism

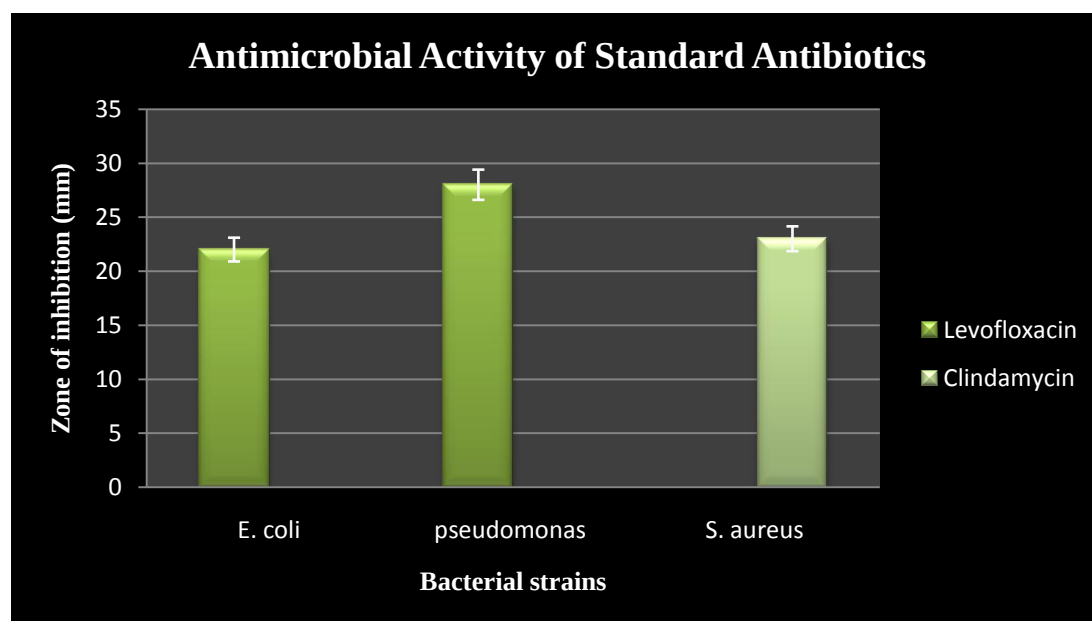
Zone of inhibition with different concentration µg/ml				
S. No.	25%	50%	75%	100%
<i>E.coli</i>	10mm	11mm	12mm	15mm
<i>Pseudomonas</i>	10mm	10mm	13mm	13mm
<i>S. aureus</i>	6mm	10mm	12mm	13mm



Graph-1 Antimicrobial activity of Gudmar plant against Pathogenic microorganisms.

Antimicrobial Activity of Standard Antibiotics

S. No.	Levofloxacin	Clindamycin
E.coli	22mm	-
Pseudomonas	28mm	-
S. aureus	-	23mm



Graph: 2 Antimicrobial Activity of Standard Antibiotics.



Fig1. *E.coli* gudmar antimicrobial activity.



Fig 2. *Pseudomonas* gudmar antimicrobial



Fig3. *S.aureus* gudmar antimicrobial activity. Fig4. Levofloxacin *E.coli* antibiotic disc.

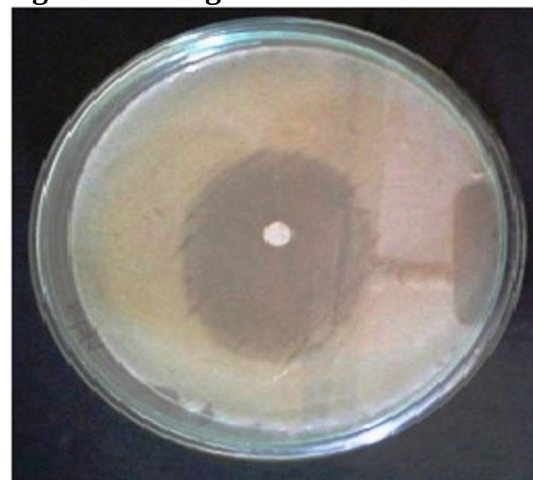
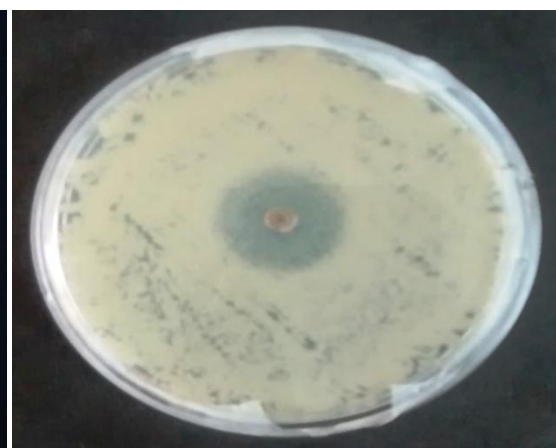
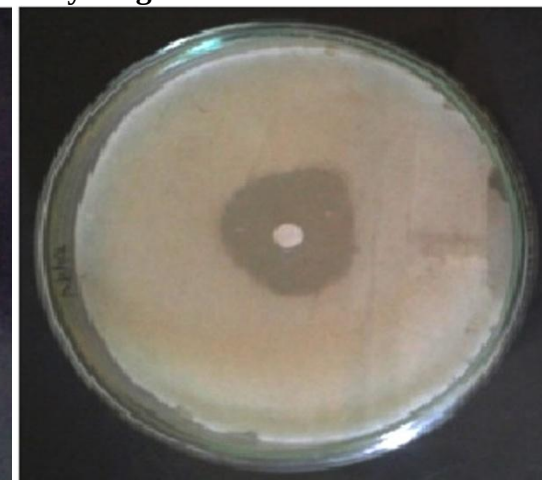


Fig5. Levofloxacin *Pseudomonas* antibiotic disc. Fig6. Clindamycin *S.aureus* antibiotic disc.



CONCLUSION

In conclusion, the results provide a scientific base for the traditional use of *Gymnema sylvestre* as antibacterial agent . *Gymnema sylvestre* may posses highest potential for therapeutic action in the treatment of infectious diseases by species *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Further study is needed for isolation and characterization of bioactive compounds responsible for antibacterial activity.

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