



ANTIMICROBIAL POTENTIAL OF HYDROALCOHOLIC EXTRACT OF *THEVETIA PERUVIANA*

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ABSTRACT:

The present study was aimed to establish the claims about antimicrobial activity of hydro-alcoholic extract of *Thevetia peruviana*. The hydro-alcoholic extract of *Thevetia peruviana* was subjected to antimicrobial study against various gram positive, gram negative bacteria by disc diffusion method. Strains of Gram-negative bacteria [*Escherichia coli*] and strains of Gram-positive bacteria [*Staphylococcus aureus*] are used to carry out anti-microbial activity. The hydro-alcoholic extract of *Thevetia peruviana* has shown zone of inhibition of 14mm for *Staphylococcus aureus*, 16mm for *E. coli* and 12mm for the fungus *Candida albicans*. Amoxicillin was used as standard for the study.

KEY WORDS: Disc diffusion, Antimicrobial, *Thevetia peruviana*, Fungus, Bacteria.

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INTRODUCTION:

Healing with medicinal plants is as old as mankind itself. The connection between man and his search for drugs in nature dates from the far past, of which there is ample evidence from various sources: written documents, preserved monuments, and even original plant medicines. The knowledge of the development of ideas related to the usage of medicinal plants as well as the evolution of awareness has increased the ability of pharmacists and physicians to respond to the challenges that have emerged with the spreading of professional services in facilitation of man & apposes life^[1].

Ever since ancient times, in search for rescue for their disease, the people looked for drugs in nature. In view of the fact that at the time there was not sufficient information either concerning the reasons for the illnesses or concerning which plant and how it could be utilized as a cure, everything was based on experience. In time, the reasons for the usage of specific medicinal plants for treatment of certain diseases were being discovered; thus, the medicinal plants' usage gradually abandoned the empiric framework and became founded on explicatory facts^[2].

The number of multi-drug resistant microbial strains and the appearance of strains with reduced susceptibility to antibiotics are continuously increasing^[3]. This increase has been attributed to indiscriminate use of broad-spectrum antibiotics, immunosuppressive agent, intravenous catheters, organ transplantation etc. In addition, in developing countries, synthetic drugs are not only expensive and inadequate for the treatment of diseases but also often with adulterations and side effects. Therefore, there is need to search new infection-fighting strategies to control microbial infections like the extracts of the plants significantly inhibited the growth of all the pathogens. That's the reasons for the usage of specific medicinal plants for

treatments of certain diseases were being discovered and thus medicinal plants usage gradually increased^[4].

Even though pharmaceutical industry has produced a number of new antibiotics in the last three decades, resistance to these drugs by microorganisms has increased. The problem of microbial resistance is growing and the outlook for the use of antimicrobial drugs in the future is still uncertain. Therefore, actions must be taken to reduce this problem, developing research to better understand the genetic mechanisms of resistance, and to continue studies to develop new drugs, either synthetic or natural. The ultimate goal is to offer appropriate and efficient antimicrobial drugs to the patient^[5].

Thevetia peruviana belongs to the family Apocynaceae and commonly called as yellow oleander or Pila Kanher. *Thevetia peruviana* having valuable properties, seed oil was used to make a bio pesticide. The plant parts are used for treatment of various disorders in human being such as, liver toxicity, fungal infection, microbial infection, inflammation, pyrexia and relive pain.^[6]

MATERIALS AND METHOD:^[7]**Collection of Plant Material:**

The leaves of *Thevetia peruviana* of family: Apocynaceae were collected from fields of Uluberia, Howrah. The leaves these plants were subjected to surface sterilization using 50% ethanol and then shade dried for further analysis.

Drying and Pulverization:

Leaves of *Thevetia peruviana* were collected and cut into small pieces .it was shed dried and pulverized to mash size 22 and stored in air tight container for further use.

Extraction of Crude Drug:

The leaves of *Thevetia peruviana* were dried under shade, ground to half dust (each 1 kg) and extracted with aqua: alcohol 1:1 by using Soxlet apparatus by hot extraction method. The extract was filtered and the filtrate evaporated to dryness under reduced pressure by using rotary vacuum at 40° C. The crude extracts were stored at 4°C before performing biological activity and the net weight of extract was 150 gm. The extract was found to be greenish brown colour.

Antimicrobial Activity: [8,9]**Microorganisms**

The strains were obtained from Madeor Pharmaceuticals Pvt. Ltds, Uluberia. The stock culture was maintained on nutrient agar media at 37°C. The 24hr culture of those microorganisms was used in the study. The bacterial cultures were maintained on nutrient agar medium respectively, and were stored at 4°C for determining antimicrobial activity of *Thevetia peruviana* plants

leaves. Gram Positive Bacteria: *Staphylococcus aureus*. (ATCC - 6538). Gram Negative Bacteria : *Escherichia coli*. (ATCC -8739). Fungi: *Candida albicans*. (ATCC -10231).

Antibacterial activity by Disk Diffusion method:

Nutrient Agar media was prepared and sterilized in a flask and cooled to 45-50 °C and was distributed by pipette (25ml) in each pre sterilized petridishes, previously inoculated with 0.01ml of the nutrient broth cultures and swirled to distribute the medium homogenously. Disks injected with extract (500µl/ml) were placed on the solid agar medium by pressing slightly. The treated petri-plates were placed at 4°C for one hour and then incubated at 37±0.1°C for 24 hrs. Same has been done for standard drug Amoxicillin and control. Lastly, the zones of Inhibitions formed on the media were measured with a transparent ruler in millimetres.

RESULT AND DISCUSSION:**Table .1:** Antibacterial activity of hydro-alcoholic extract of *Thevetia peruviana*

Extract & Standard	Zone of Inhibition (mm)		
	<i>Staphylococcus aureus</i>	<i>Escherichia coli</i>	<i>Candida albicans</i>
Thevetia extract	14	16	12
Standard (Amox.)	18	20	-

#Amoxicillin (1000µg/ml) was used as standard drug, ## Control has shown no activity.

The problems regarding application of conventional antibiotics, including antimicrobial resistance, environmental problems, side effects and high costs, have reinforced a tendency to

replace synthetic antimicrobials with natural alternative agents. Plant based products are among the alternative agents examined in order to replace conventional antibiotics. Accordingly, extensive

research has been carried out in order to evaluate the antimicrobial effect of the essential oils and extracts which showed the ability to inhibit the growth of various pathogenic microorganisms.^[10]

The results imply that, the extract of *Thevetia peruviana* plant exhibited more or less antibacterial potencies affecting Gram positive, Gram negative bacteria used in the present study. It is evident from the results that, the extracts of *Thevetia peruviana* leaves significantly inhibited the growth of *E. coli* and *Staphylococcus aureus*. The test organisms like *Escherichia coli* and *Staphylococcus aureus*, were proved to be maximum level of susceptibility to *Thevetia peruviana* extract with respect to increasing doses.

In the present study we have evaluate the antimicrobial potential of extract of *Thevetia peruviana* against different microorganisms. Strains of Gram-negative bacteria [*Escherichia coli*] and strains of Gram-positive bacteria [*Staphylococcus aureus*] are used to carry out antimicrobial activity. The study showed that hydro-alcoholic extract of *Thevetia peruviana* has good antimicrobial activity against the tested strains. The

hydro-alcoholic extract of *Thevetia peruviana* has shown zone of inhibition of 14mm for *Staphylococcus aureus*, for *E. coli* it has shown a zone of inhibition of 16mm. For fungus *Candida albicans*, zone of inhibition was 12mm.

CONCLUSION:

To conclude, we could say, the hydro-alcoholic extract of *Thevetia peruviana* leaves could be an excellent source of antimicrobial drug. Probably the activity shown by the plant is due to the combined effect of various constituents present or may be due to a single lead molecule, which needs to be studied further. Further studies could be conducted to isolate the lead molecule and conduct antimicrobial study the isolated bioactive compound.

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