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RESEARCH ARTICLE

# Antimicrobial Activity of Acetone Extracts of *Thavetia peruviana*

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**ABSTRACT**

*Thevetia peruviana* are potentially lethal plants after ingestion. The plants is common toxicological emergency in tropical and subtropical parts of the world and international self-harm, using *T. peruvian* is prevalent in south Asian countries, especially in India and Sri Lanka. All parts of these plants are toxic, and contain a variety of cardiac glycosides including nerifolin, thevetin A, Thevetin B and oleandrin. Ingestion of oleander results in nausea, vomiting, abdominal pain, diarrhoea, disrhythmias and hyperkailemia in most cases; clinical management of poisoning by either *N. oleander* or *T. peruviana* involves administration of activated charcoal and supportive care. This article compiles all the information related to *Thevetia peruviana.*

**Key words**: oleander poisoning, arrhythmias, cardiac glycosides, cannogenin. Pharmacological

## INTRODUCTION

*Thevetia peruviana* belongs to the family Apocynaceae and it commonly known as Yellow oleander and Lucky nut. It is an ornamental plant which grows in India, China, Australia. Decoction of the stem bark of *Thevetia peruviana* is used as an antipyretic [1] agent. Seed extracts are also shows genotoxic assessment [2]. Flavonone and Flavonal glycosides from the leaves of *Thevetia peruviana* exhibit HIV-I reverse transcriptase and HIV-I intrase inhibitor activities [3]. It has also been regarded as potential source of biologically active compound, namely insecticides, rodenticides, fungicides and baectercides, that means *Thevetia Perruviana* plant extract have also been reported have Antimicrobial properties against *Cladosporium cucumerinum* [4,5].

Use of medicinal plants in the treatment of skin diseases was practiced by folk people since many decades. External applications of herbal medicines in crude forms like paste, tincture and infusion play a significant role to nullify the effect of harmful pathogens residing on skin. *Thevetia neriifolia*, Juss belonging to family Apocynaceae was reported to have many curative effects against skin infections, in addition to the healing potential towards various conditions such as edema, insomnia, hemorrhoids, malaria, snake bites, etc.[6]Its root paste was recommended to be applied externally to treat Leprosy.[7]All plant parts are useful in treating scorpion stings, snake bites, leprosy, ringworm and other skin diseases.[8] The plant is useful in urethraldischarges, repelling worms, valuable against skin disorders, leucoderma, wounds and piles and is astringent to bowels. In Guiana, the seeds are used as a purgative in rheumatism and dropsy, it is also considered as a good alexiteric. Studies conducted by various investigators [9] ealed the anti-diarrheal, cytotoxic and insecticidal activities of leaves, seeds, stem and roots in addition to antimicrobial activity against some common pathogenic bacteria and fungi. Several types of bacteria have ability to produce skin infections, of these *Staphylococcus aureus* and *Streptococcus pyogenes* are the most common organisms that cause various cutaneous infections such as cellulites, erysipelas, impetigo, folliculitis, furuncle, carbuncle and abscess. [12-14]

## MATERIALS AND METHODS

### Collection of Plant Material

Plant materials were collected at the MIT Camps and authenticated from.Agriculture collage, Mandsaur by Mr. S.N. Sharma The Herberium No. is (MIP/P'Cognosy/ 2015/509) was submitted in Department of Pharmacognosy at Mandsaur Institute of Pharmacy, Mandsaur.

### Preparation of extract

About 50 gm powder of leafs was extracted with different solvents by using Soxhlet apparatus until the extractive was clear. The extracts were

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concentrated in water bath at $50^0$C then extracts were stored in refrigerator at $4^0$C for further use.

**Test Microorganisms**

In this study *Streptococcus pneumoniae, Escherichia coli, Pseudomonas aeruginosa, S. epidermis* and *Staphylococcus aureus* were used.

**SCREENINGOFANTIMICROBIALACTIVIY**

**Preparation of Media**

The definite volumes of peptone (1%), Beef extract (1%), Agar (3%) and Sodium chloride (0.5%) were dissolved in distilled water and pH was adjusted to 7.2. This solution was sterilized by autoclaving at 15 p.s.i. for 20 min.

**Preparation of sub-culture**

One day prior to this testing, inoculation of the above bacteria cultures were made in the nutrient agar and incubated at $37^0$C for 18-24 hr.

**Preparation of test solutions**

Test compound (5.0 mg) was dissolved in dimethylsulphoxide (5.0 ml) to give a 1,000 □g/ml this solution was used for testing.

**Antimicrobial activity testing method**

Whattman Filter paper discs of 7 mm diameter were prepared, sterilized and dipped in test and standard (Ofloxacin) drugs (each disc absorbs approximately 0.08 ml of solution). Using an ethanol dipped and flamed forceps, both reference standard and test drug discs were aseptically placed opposite each other over nutrient agar plates seeded with the respective test microorganisms.

**Incubation**

The plates were incubated in an upright position at 37ºC for 24-48 hours. The diameter of inhibition zones (in mm) & % inhibition of Zone were measured and the results were recorded .[15]

**RESULTS AND DISCUSSION**

Different strain of gram negative bacteria and positive bacteria isolated viz.,*Escherichia coli* , *Streptococcus pneumoniae* were used in the present study. The results of *in vitro* antimicrobial activity of *Thavetia paruviana* are presented in (**Table 1).**

**Table 1: Antimicrobial Activity of *Thavetia paruviana***

| S. No | Test Organism | Standard (Ofloxacin) Zone of inhibition (mm) | Test Zone Of inhibition (mm) |
|---|---|---|---|
| 1 | *Streptococcus pneumoniae* | 23 | 10 |
| 2 | *Staphylococcus aureus* | 22 | 12 |
| 3 | *Staphylococcus epidermis* | 22 | 13 |
| 4 | *Escherichia coli* | 25 | 12 |
| 5 | *Pseudomonas aeruginosa* | 22 | 10 |

The diameter of inhibitory zones recorded includes the size of filter paper discs (6mm in diameter).

The *in vitro* anti microbial activity of Acetone extracts of *Thavetia peruviana* on gram-positive and gram-negative bacteria collected from Mandsaur Institute of Science & Technology, Mandsaur were studied. These results are shown in (Table 1) the maximum activity was on *S. epidermidis* (13mm) and minimum activity was on *Pseudomonas aeruginosa, S. pneumoniae* (10 mm), among the gram positive bacteria. The inhibition zone, especially on Ofloxacin resistant was 26-27mm respectively.

On the other hand the maximum activity was observed on E. coli (14mm) among the gram negative bacteria. The anti bacterial activity of the plant on antibiotic resistant strains was especially notable.

The yield of Acetone extracts obtained from air dried plant material was 1 gm, these extract showed strong antimicrobial activity on *Staphylococcus epidermidis* and *Staphylococcus aureus*. It is important that the Acetone extracts of have antimicrobial activity on E-coli ,which are multiple antibiotic bacteria, because E-coli is a biogenic amine procedure in food[7].Also E- coli has become an important agent of nosocomial infection[8].

The Acetone extracts also inhibited the growth of multiple antibiotic resistant Staphylococcus stain, tested. The effect of Acetone extracts on *S. aureus* and *S. epidermidis* were high. *S. aureus* is a one of the most common causes of both hospital and community-acquired infection worldwide [9]. *S. aureus* is a major cause of cutaneous infections, furunculosis, impetigo and arthritis, and toxinoses, such as food poisoning, septic shock, scalded skin syndrome and toxic shock syndrome [10].The presence of antibiotic resistant staphylococci is of concern due to the possible spread of resistance determinants among the staphylococcus species. This could lead to the survival, growth and spread of enterotoxigenic staphylococci and staphylococci of clinical significance [11].

The inhibition zone of the Acetone extracts of these *Thavetia paruviana* materials collected from different location, on bacteria, were similar (Table 1). The study demonstrates that had antimicrobial activity on Gram-positive and Gram-negative bacteria.

## CONCLUSION

The above study concluded, the traditional use of leafs of *Thavetia paruviana* (pili kner) as an anitimicrobial activity have been confirmed as the leaf extracts displayed activity against the microbes used in the study. Further studies need to establish the mechanism of action is required.

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