



Anticariogenic Activity of *Thevetia Peruviana* Fruit Latex.

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ABSTRACT:

Plant based therapeutics play an important role in the public health care system of any nation. The plant *Thevetia peruviana* belongs to the family Apocynaceae. The plant has a significant place in traditional system of medicine of Central and South America and tropical Asia. A number of different classes of secondary metabolites are present in *Thevetia peruviana* including alkaloids, flavonoids, steroids, cardiac glycosides, terpenoids, tannins, saponins etc. Several researchers had identified various pharmacological activities in different parts of the plant viz. seeds, flowers, bark, fruits, leaves. In present study ethanolic extract of fruit latex were tested by Agar well diffusion method, the ethanolic extract shows antibacterial activity against the test cariogenic bacterial stains. The study concludes that *Thevetia peruviana* have biologically active compounds which are effective in treatment of Dental carries.

Keywords: Anticariogenic activity, extraction, secondary metabolites, Agar well diffusion method

Introduction:

The medicinal plants are a divine gift to us from 'mother nature' who has kept these green remedies in her plant kingdom for mankind to use and re against various diseases and ailments. It is up to us to explore, seek, search and reap the benefits of this precious treasure. At present there are many valuable and lifesaving medicines obtained from plants. The plant word comprises rich store house of biochemical that could be tapped for uses as antimicrobial agent ^[1].

Thevetia peruviana is a medicinal plant with wide array of pharmacological properties, but yet not received considerable scientific attention. The plant belongs to the family Apocynaceae and is commonly known as yellow oleander. The plant is native to Central and South America, especially Mexico, Brazil and West Indies but now frequently cultivated throughout the tropical including India and Srilanka as an ornamental plant ^[2]. Now-a-days, dental caries is very common in industrialized as well as under developed and low-income countries. Inferring a history, plants are rich in antimicrobial drug source. So, it is priority to discover an herbal treatment for dental caries ^[3]. The present study was taken up to conduct anticariogenic activity studies of fruit latex of *Thevetia peruviana*.

Material and Methods:

1. Collection of plant material:

Thevetia peruviana Latex was collected between June and July were collected from the surrounding fields of Pandharpur, Solapur. All plant and their products were identified and authenticated by botanist KBP College Pandharpur.

2. Extraction of plant material:

500 gm of fresh fruits of *Thevetia peruviana* were collected, washed 2-3 times with distilled water and used for extraction. 50 gm of milky white latex was obtained by incising the fruits. The latex was air dried and treated with petroleum ether eliminate any chlorophyll pigments and rubber materials that were present. The air dried latex was then extracted by maceration using 80% aqueous ethanol ^[4].

3. Bacterial strains for anticariogenic activity:

A group of bacteria that cause tooth caries were selected. *Lactobacillus acidophilus* (NCIM5306), *Lactobacillus casei* (NCIM5303), *Streptococcus mutans* (MTCC890) and *Staphylococcus aureus* were used in present study to study the antimicrobial activity of the prepared extract. *L. acidophilus* and *L. casei* were procured from National Collection of Industrial Microorganism (NCIM), CSIR-National Chemical Laboratory, Dr. Homi Bhabha Road, Pune-411008, and *S. mutans* was procured from Microbial Type Culture and Gene Bank (MTCC), Institute of Microbial Technology, Shanti Path, 39A, Sector 39, Chandigarh, 160036, India. *S. aureus* procured from BLDE Shri B. M. Patil Medical College Hospital & research Centre, Solapur road, Vijayapur 586103.

4. Preparation of bacterial inoculum:

Broth cultures of the selected bacteria were prepared by inoculating a loop full of bacteria into organism-specific media and incubated at optimal temperature. MRS media was used for *L. acidophilus* and *L. casei*. Enriched infusion heart media for *S. mutans* and Nutrient broth media for *S. aureus* were employed respectively. The bacterial suspension was compared with 0.5Mc Farland turbidity standards, which is equivalent to approximately 1×10^8 bacterial cell count per ml. Such prepared bacterial suspensions were used for antimicrobial studies^[5].

5. Agar well diffusion method:

The anticariogenic activity of extract of *Thevetia peruviana* fruit (latex) was studied by agar well diffusion method. The plant extracts were dissolved in diethyl sulfoxide and were tested at three concentrations viz. 10, 50 and 100 mg/ml. The agar plates were prepared and labeled for specific bacteria and extract. A fresh bacterial culture of 100 μ l having 1×10^8 CFU/ml was spread on agar plates using sterile cotton swab. 6mm diameter well was made with a sterile borer. The prepared wells were filled with 100 μ l of respective plant extracts. Plates were placed in the refrigerator for 30 min. for diffusion of extracts. Then plates were incubated at 37°C for 24 hrs. The zone of inhibition was measured. Tetracycline (100 μ g/ml) was used as a standard drug for comparison^[6].

Result:

The anticariogenic activity of the plant extracts and their efficacy were quantitatively assessed by measuring the zone of inhibition. The plant extracts were tested for anticariogenic activity by agar well diffusion method. It was tested at three concentrations viz. 50, 100 and 200 mg/ml. Dimethyl sulfoxide was used to dissolve the plant extracts. The result of sensitivity of cariogenic organisms was assessed by recording the presence or absence of Zone of inhibition in diameter. The zone of inhibition was observed at 50, 100 and 200 mg/ml concentration of ethanolic fruit latex extracts and results are summarized as under Table no.1.

Table no. 1 Anti cariogenic activity of ethanolic extract at different concentration

Sr. no	Concentration (mg/ml)	Zone of inhibition (mm)			
		<i>L. acidophilus</i>	<i>L. casei</i>	<i>S. mutans</i>	<i>S. aureus</i>
1	50	9	7	8	10
2	100	13	11.2	13	14
3	200	15.3	13.7	16	17.4
4	Tetracycline (100 μ g/ml)	24.4	27	24.2	26

Fig no.1 Anti cariogenic activity of ethanolic extract at different concentration

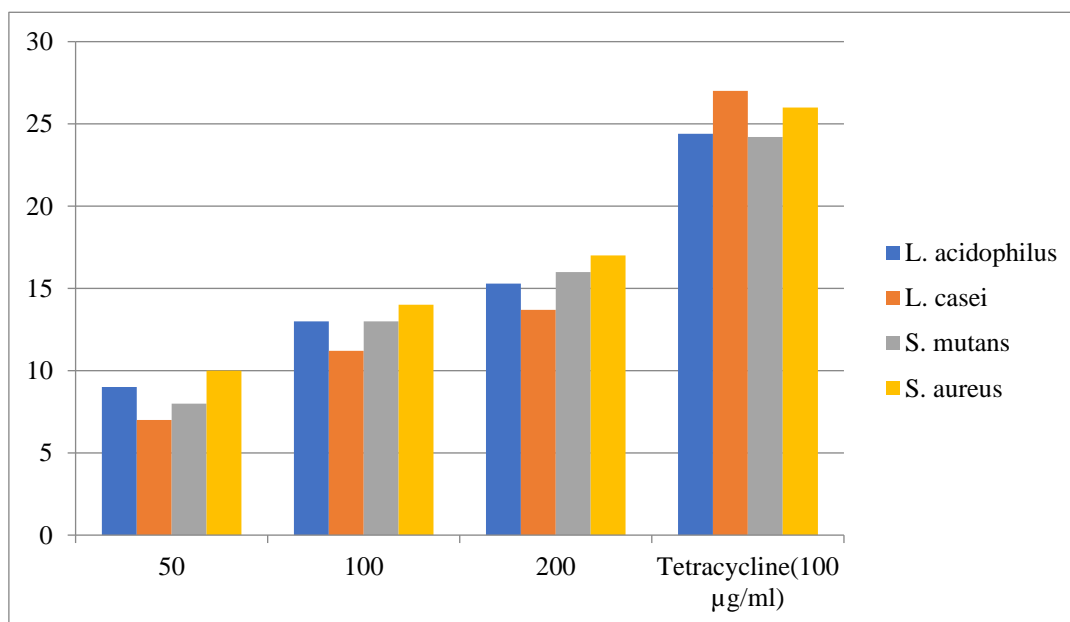
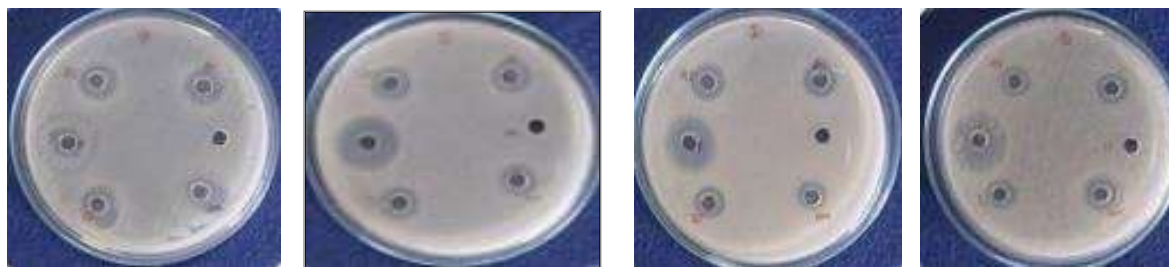


Figure no 2: Anticariogenic activity of plant extracts of *Thevetia peruviana* Fruit latex at different concentrations .*L. acidophilus**L. casei**S. mutans**S. aureus*

Conclusion:

The result of this study highlights the significance of anticariogenic activity against the selected bacterial stains from ethanolic latex extract of *Thevetia peruviana*. It will find a place in formulation of herbal medicine to control Dental carries.

Reference:

1. Ghavri Krati , Adhav Madhavi.(2019) Antimicrobial activities and phytochemical analysis of ethanolic flower extract of *Thevetia peruviana* (Pers.) K. Schum (Thevetia Yellow). Int. J. of Life Sciences, Special Issue A13, 160-168.
2. Tabrez Ahmed et al. *Thevetia peruviana*: a multipurpose medicinal plant- a review. Int. Journal Advance Research. 5(8), 486-493.
3. Mujawar, M.I., Gaviraj, E.N., Ghunaki, S.P. (2024). Phytochemical Studies and Anticariogenic Activity of Some Folklore Plants for Dental Care. In: Pawar, P.M., et al. Techno-Societal 2022. ICATSA 2022. Springer, Cham. https://doi.org/10.1007/978-3-031-34648-4_58
4. Shobowale, O. O., Ogbulie, N. J., Itoandon, E. E., Oresgun, M. O., & Olatope, S. O. (2013). A phytochemical and antimicrobial evaluation of aqueous and organic extract of *Calotropis procera* ait leaf and latex. *Nigerian Food Journal*, 31(1), 77–82.
5. Perilla MJ. Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health importance in thisdevelopingworld. Georgia, USA: WHO; 2003. pp. 209-14.
6. Agbor AM, Naidoo S. A review of the role of African traditional medicine in the management of oral diseases. *Afri.J.Trad.ComplementAlterMed*.2016; 13(2):133-42.