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Antibacterial Activity of Kantakari Seeds (*Solanum xanthocarpum*)



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HUMAN

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ABSTRACT

Objective: To examine the Antibacterial activity of *Solanum xanthocarpum* seed extracts. Methods: The extracts were obtained by the soxhlet extraction method. The inhibitory effects of different concentrations of extracts were tested against both the micro-organisms (*Streptococcus- mutans* and *Lactobacillus-acidophilus*) by using agar well diffusion method. Result: Different concentrations of seed extracts of *Solanum xanthocarpum* exhibit good activity against both the micro-organisms tested. The activity was concentration dependent. Conclusion: The encouraging results indicate that the seed extract of *Solanum xanthocarpum* can be useful as a natural antibacterial agent for the various infections.



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INTRODUCTION

Majority of environmental bacteria are resistant to synthetic drugs ^[1]. Hence there is increasing need for development of alternatives, to antibacterial agents. An alternative antibacterial agent could reduce side effects of existing medicines and provides cost effective option for developing countries. Medicinal plants represent a rich source of drugs against bacterial infections. ⁽²⁾. There are several studies on the antibacterial activity of different herbal extracts. Since ancient times plant extracts were used for antibacterial therapy ^[3-5]. For this reason, researchers are increasingly turning their interest to herbal products, looking for new compounds to develop better treatment against bacterial infection. *Solanum xanthocarpum* belonging to family Solanaceae, is a medium size tree ^[6]. It is commonly called as Kantakari. It grows on dry or moist soil. Its leaves are elliptical or ovate and are full of spines. Flowers are globular and bright blue or bluish purple in colour and seeds are circular, flat, numerous, embedded in a fleshy mesocarp about 0.2 cm in diameter ^[7, 8].

Solanum xanthocarpum plant contains alkaloids, steroids, saponins, flavonoids and also carbohydrates, fatty acids, amino acids, etc. Solasodine is the principal steroidal alkaloid. It is reputed in systems of medicines as the various parts of plant ^[9]. Solanum has been used traditionally for anti-inflammatory ^[10], anthelmintic, laxative, antipyretic, anti-asthmatic anti-inflammatory, and aphrodisiac ^[11], antidiabetic activity ^[12]

The plant extract of *Solanum xanthocarpum* also having insecticidal and molluscicidal properties ^[13]. Considering the vast potentiality of herbal plants as sources for antibacterial drugs with a systematic investigation was undertaken to screen the seeds of *Solanum xanthocarpum* for antibacterial activity.

Vernacular Names

Hindi : Rimgani, Kateli, Kattaya,

English: Wild eggplant

Sanskrit: Kantkari, Dusparsa, Ksudra, Kantakarika, Dhavani,

Gujarati: Bhoyaringani

Kannada: Kantikari

Malayalam: Kandakarichunda

Tamil: Kandan- kattiri

Telugu: Callamulaga, Nella motholunga

Oriya: Bheji-baigana



Figure 1: *Solanum xanthocarpum* (Leaves, Flower, Fruit and Seeds)

MATERIALS AND METHODS

Plant material

Solanum xanthocarpum plant was collected from the Warananagar region, Maharashtra State India. The plant was authenticated by Prof. Jadhav S. Y., Head of department of Botany, Yashwantrao Chavan Warana Mahavidyalaya, Warananagar.

Extraction of plant material

The ripened fruits were collected and shade dried. Dried fruits were crushed manually to separate out the seeds. Fine powder of separated seeds was made by grinding them in mortar and pestle. Extraction was performed by soxhlet extraction using solvent ethanol.

Susceptibility testing

Strains of micro-organism used susceptibility testing were performed using *Streptococcus mutans* and *Lactobacillus acidophilus*. These microorganisms were collected from department of microbiology, Tatyasaheb Kore Dental College, Paragoan, Kolhapur.

Determination of antibacterial activity

Extracts were analyzed for their potential antibacterial activity by the standard agar well diffusion method ⁽¹⁴⁾. The test bacterial strains were inoculated into Mueller Hinton Agar medium. The Different concentration of extract were poured in the wells and the plates were kept in refrigerator at 15⁰C for 10 minutes for diffusion then the plates were incubated for 24 hours at 37⁰C. The antibacterial activity of each extract was expressed in terms of zone of inhibition (in mm).

Minimum inhibitory Concentration

The Minimum inhibitory concentration (MIC) were estimated by broth dilution technique was used to estimate the Minimum inhibitory concentration. The test tubes were incubated at 37°C for both types of bacterial cultures. The MICs which was determined at the lowest concentration of plant extracts inhibiting the growth of the organism ⁽¹⁵⁾

RESULTS AND DISCUSSION

The seed extract decreases the growth of pathogenic microorganisms. Maximum zone of inhibition was obtained in 500µg concentration of seed extract for both the bacteria screened and Minimum zone of inhibition was obtained in 20µg concentration of seed extract. The Minimum inhibitory concentration of 50-100µg/ ml was found against both the bacteria.

Table No.1 Antibacterial activity of seed extracts of *Solanum xanthocarpum*

Sr. No.	Name of Micro-organism	Concentration of Seed Extract (ug)	Zone of Inhibition (mm)
1.	<i>Streptococcus-mutans</i>	20	9
		50	11
		100	15
		200	19
		500	24
2.	<i>Lactobacillus-acidophilus</i>	20	7
		50	10
		100	14
		200	18
		500	22

CONCLUSION

Solanum xanthocarpum is the most effective plant against pathogenic microorganisms. The zone of inhibition depends upon concentrations of the extracts ⁽¹⁶⁾ Agar well diffusion method was effective against both strains of microorganisms ⁽¹⁷⁾. For extraction process ethanol was suitable solvent ⁽¹⁸⁾. However, further studies are needed to isolate the possible constituents who may be responsible for the activity

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