

Antibacterial Activity Of *Syzygium Cumini* L. (Jambhul) Seed Extract Against Pathogenic Bacteria



Microbiology

KEYWORDS : Antibacterial activity, *E.coli* and Ethanol.

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ABSTRACT

Practitioners of traditional system of medicine recommend the powder prepared from the jamun seeds mixed with a small piece of jaggery for relief from diarrhoea and dysentery. Antibacterial activity of *Syzygium cumini* L. seed extracts prepared in Chloroform, Petroleum ether and Ethanol was evaluated by disc diffusion method. The solvent extracts is exerted a broad spectrum of bacteriostatic action against different gram-positive and gram-negative bacteria. Maximum antibacterial activity was observed in the ethanol extract against *E.coli*. The seed extract is shown the high therapeutic value against pathogenic bacteria and documented for futures.

INTRODUCTION:

About 80% of individuals from developed countries use traditional medicine, which has compounds derived from medicinal plants. Therefore, such plants should be investigated to better understand their properties, safety and efficiency (Garode and Waghode, 2014). The study of indigenous plant use by people of a particular culture and region is known as Ethnobotany. Medicinal plants are important with respect to new drug and pharmacological research development. They are widely used and accepted as home remedies and raw materials for the pharmaceutical industry (Mule *et al.*, 2013).

Practitioners of traditional system of medicine recommend the powder prepared from the jamun seeds mixed with a small piece of jaggery for relief from diarrhoea and dysentery. Those suffering from bleeding gums and unhealthy teeth may use the ash from the burnt jamun leaves to brush the teeth twice a day (Debjit *et al.*, 2013).

Therefore, one approach being used for the discovery of antibacterial agents from natural sources is based on the evaluation of traditional plant extracts. In present study, we report the antibacterial activity of seeds extract of *S. cumini* L. against pathogenic bacteria.

MATERIALS AND METHODS:

Fruits and seeds of *Syzygium cumini* L. were collected from the local area of Chikhli Tahsil of Buldana district. Seeds were washed and dried in the oven at 40°C. The dried seeds were then crushed into fine powder and then used for further study. Extracts were prepared by addition of 5 gm dried powder into the 50 ml of various organic solvents such as Chloroform, Petroleum ether and Ethanol ether kept at room temperature for 24 hrs. The mixture was filtered using Whatman filter paper No.1. Filtrate was collected and stored at 4°C for further use. The plant extract prepared in various solvents and compound purified by TLC were tested for the antibacterial activity against pathogenic bacteria such as *E.coli*, *P. aeruginosa*, *S. typhi* and *S. aureus*. Antibacterial activity was carried out by disc diffusion method according to the method described by (Perez *et al.*, 1990). In each well 100 µl of extract was added and organic solvents were used as negative control in 6mm Whatman filter paper No.1 disc. The antibacterial activity of each extract expressed in terms of diameter of zone of inhibition (in cm) produced by respective extract.

RESULTS AND DISCUSSION:

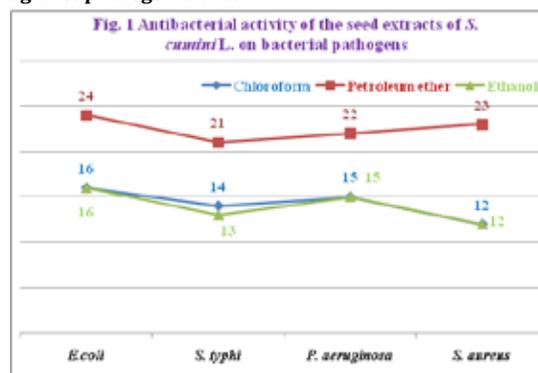
Medicinal plants are important with respect to new drug and pharmacological research development. The antibacterial activity of the seeds extract of *S. cumini* L. was performed. The antibacterial activity of chloroform extract on *E.coli* was shown maximum (16mm) followed by *P. aeruginosa* was 15 mm, *S. typhi* was 14 mm and *S. aureus* was 12 mm. In Petroleum ether extract on *E.coli* was shown maximum (24 mm) followed by *P. aeruginosa* was 22 mm, *S. aureus* was 23 mm and *S. typhi* was 21 mm.

Table 1 antibacterial activity of the seed extracts of *S. cumini* L. on bacterial pathogens

Test organism	diameter of zone of inhibition (in mm)		
	Chloroform	Petroleum ether	Ethanol
<i>E.coli</i>	16	24	16
<i>S. typhi</i>	14	21	13
<i>P. aeruginosa</i>	15	22	15
<i>S. aureus</i>	12	23	12

Finally in ethanol extract, the antibacterial activity against *E.coli* was shown maximum (16 mm) followed by *P. aeruginosa* was 15 mm, *S. typhi* was 13 mm and *S. aureus* was 12 mm which was shown in table 1. From the above results, it was found that the seed extracts of *S. cumini* L. was shown efficient activity against pathogenic bacteria in various extracts which was shown in

fig. 1. The seed extract is shown the therapeutic value against pathogenic bacteria.



Similarly, Gowri and Vasantha (2010) have reported antimicrobial activity of *S. cumini* leaves in methanol extract. The extracts showed inhibitory activity against clinical isolates of gram negative bacteria such as *Salmonella typhi*, *Shigella dysenteriae*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Escherichia coli* and gram positive bacteria such as *Bacillus subtilis* and *Staphylococcus aureus* (Annamalai *et al.*, 2012).

CONCLUSION:

The present study has helped in demonstrating the potential bioactive compound of natural plant extracts. This seed extract has high antibacterial activity and thus can be used against multidrug resistant bacteria and as an herbal medicine alternative to the antibiotics. This study suggests that the P. ether extract of *Syzygium cumini* seed has potent antibacterial activities. A result was found that the seed extracts of *S. cumini* L. was shown efficient activity against pathogenic bacteria in various extracts. The seed extract is shown the high therapeutic value against pathogenic bacteria and documented for futures.

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