



ANTIMICROBIAL POTENTIAL OF BALANITES ROXBURGHII

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Abstract

The *Balanites roxburghii* is a shrub or small evergreen tree. It is also known as 'Desert date' and 'Hingoli'. In the present study, the antimicrobial potential of stem and leaf ethanolic extract against *S. aureus* & *E. coli* was measured by Disc-diffusion Assay. The results clearly show that the crude extract of *B. roxburghii* has antibacterial action against *S. aureus* and *E. coli*.

Keywords:- *Balanites roxburghii*, Desert date, antimicrobial potential, Disc-diffusion Assay

Introduction

The *Balanites roxburghii* is a shrub or small evergreen tree rarely reaching 9.5m in height, with stout spines, 1-6cm long, and pubescent young parts pubescently pubescent. It is also known as 'desert date' in English and 'Hingoli' in Hindi (Gaur, K. et al., 2008) the fruit is an ovoid drupe with a sweet pulp possessing an unpleasant odour. Fruit Pulp contains five steroidal saponins, designated as balanitism A, B, C, D and E. Two furostanol glycosides and 6- α -methyl diosgenin were also obtained from the fruits (Shah K. H., 2019). Various portions of the *Balanites* tree have been utilised in traditional medicine in various African and Asian countries (Mohamed, A. M et al., 2002 and Neuwinger, H. D. 1996). Various *Balanites* extracts have been shown in the literature to have antifeedant, antidiabetic, molluscicide, anthelmintic, and contraceptive properties (Ibrahim, A. M., 1992; Kamel, M. S. et al., 1991; Liu, H. W. and Nakanishi, K. 1982 and Rao, M. V. & Shah, K. D., 1997). This plant's bark,



unripe fruits, and leaves are said to have antihelminthic, antifertility, purgative, and antidiarrheal qualities (Chopra, R. N., et al., 1956)

Materials and Method

Collection of Plant Materials

The stem and Leaf of *Balanites roxburghii* was collected from the villages around the Singhania University, Pacheri Bari, by researchers and authenticated by Department of Botany at the university.

Preparation of the Plant materials

Balanites roxburghii plants parts were freed from dust, and foreign material, then dried indoors at room temperature for three days.

Preparation of extract:

Ethanol extracts of plant material (Shoot & Leaf) prepared by successive solvent extraction method in a Soxhlet extractor were used for determining the antimicrobial potential. A sterilized disc of Whatman paper, already dipped in 70% ethanol was used as control. Gentamicin was used as standard antibiotics.

Microorganisms used : *S. aureus* (Gram positive) and *Escherichia coli* (Gram Negative) were used as a test microorganism. The stock cultures were maintained on nutrient agar medium at 4°C. The microorganisms were activated by inoculating a loopful of the strain in the nutrient broth (25ml).

Antimicrobial Testing

Using two bacterial strains, the plant extract was evaluated for antibacterial activity using the Disc-diffusion Assay (Rasoanaivo and Ratsimamang, Urverg, 1993). In sterile 9 cm petridishes with 10 ml of nutritional agar inside, the base plants were covered



with a diluted bacterial culture (0.5 ml) of the appropriate strains. Each and every extract's ingested disc was placed in the middle of a petriplate with solidified nutrient agar. Each plate was parafilm-sealed and incubated at 37°C for 24 hours before recording the inhibitory zone. Inhibition zone (mm) ratios obtained by extracts were used to measure antibacterial activity.

Results and Discussions

(1) Control: As a control, a sterilised disc of Whatman paper that had already been soaked in 50% ethanol was employed. There was no zone of inhibition against either of the two experimental bacterial strains.

(2) Standard:

(A) Gentamicin :The sterilised disc was immersed in the standard streptomycin solution that had been prepared. It had the greatest antibacterial activity (42 mm) against *S. aureus* and the least amount against *E. coli*. (28 mm)

(3) Ethanol Extract

(A) Stem extract: According to the diameters of their zones of inhibition, stem extract in ethanol had the greatest antibacterial activity against the bacteria *S. aureus* (10 mm) and the least activity against *E. coli* (07 mm).

(B) Leaf extract: According to the diameters of their zones of inhibition, Leaf extract in ethanol exhibited the greatest antibacterial activity against the bacterium *S. aureus* (08 mm) and the least activity against *E. coli* (04 mm).



ETHANOL EXTRACT

Table-1: Diameter of zone of inhibition showed stem and leaf extracts of *Balanites roxburghii* against tested bacteria. (In mm)

	<i>E.Coli.</i>	<i>S. aureus</i>
50% Ethanol	-----	-----
Stem Extract	7	10
Leaf Extract	4	8
Gentamicin	28	42

The Stem ethanol extract of *Balanites roxburghii* showed maximum antimicrobial potential against bacteria *S. aureus* (10mm) & least potential against *E.Coli* (7mm) while its Leaf extract maximum antimicrobial activity against *S. aureus* (8mm) and least activity against *E.coli* (4mm).

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