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ANTIBACTERIAL ACTIVITY OF STEM BARK OF *ABUTILON INDICUM* (LINN) SWEET

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ABSTRACT

Present study was designed to evaluate the antibacterial activity of *Abutilon indicum* (Stem bark) methanol extract. Antibacterial activity was tested against Gram-positive bacteria i.e. *Staphylococcus aureus* and Gram negative bacteria *Escherichia coli*. Evaluations were based on the zone inhibition by using cup plate method. Results showed that *Abutilon indicum* showed highly significant results against both the bacteria.

KEYWORDS

Antibacterial activity, Cup plate Method and *Abutilon indicum*.

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INTRODUCTION

Nature play an important role to provide Medicinal plants (varieties of chemical constituents) for the treatment of many diseases of human beings to make disease free healthy life. India is one of the most medico- culturally diverse countries in the world where the medicinal plant sector is a part of time- honored tradition that is a respected even today. Here, the major traditional systems of medicine include Ayurveda, Unani and Siddha. Currently approximately 80% of the world people relies on plant derivative medicines and serves as first line of defense in maintaining health and fighting many diseases. *Abutilon indicum* has long been used as an Antioxidant activity, hypoglycemic activity Larvicidal activity Analgesic activity Anti

diabetic activity anti-microbial activity, wound healing activity, Anti-diarrhoeal activity. *Abutilon indicum* has hair like structures, so they are also called hairy herb or under shrub found in the outer Himalayan tracts from Jammu to Bhutan up to an altitude of 1500 m and extending through the whole of northern and central India. It may be found at dry and poor soil and require hot conditions. In India it is very common on roadsides and waste places generally to grow after the rainy season^{1,2}.

Plant Description

The leaves are ovate, acuminate, notched, rarely subtrilobate and 1.9-2.5 cm long. Yellow color flowers are found in the plant, peduncle jointed above the middle. The petioles 3.8-7.5 cm long; stipules 9 mm long; pedicels often 2.5-5 mm long, axillary solitary, jointed very near the top; calyx 12.8 mm long, divided in to middle, ovate lobes, apiculate and corolla 2.5 cm diameter, yellow, opening in the evening. The capsule like fruit is present, which are densely pubescent, with conspicuous and horizontally spreading beaks. The stems are heavy, branched, 1-2 m tall, pubescent. The seeds are 3-5 mm, reniform, tubercled or minutely stellate-hairy, black or dark brown³.

MATERIAL AND METHODS

Collection of Plant material

The fresh plant material was collected from campus of R.K Pharmacy College, District Azamgarh, Uttar Pradesh State, India. The plant *Abutilon Indicum* (Linn.) is one of the important member of the family *Malvaceae*.

Preparation of Extract

After collection of plant, they were washed by running tap water and shadow dried for 15 days. After proper drying, they were made to powdered. The dry powder was extracted by refluxed in 100 ml methanol for 24 h, using a Soxhlet apparatus. After extraction of powder sample, Extract was collected, evaporated and stored properly in moisture free container. The methods were adopted for the preparation of dilution of crude extract for antibacterial assay. The extracts were dissolved as per mg/ml in the same solvent and further dilutions

were made as 25µg/ml, 50µg/ml, 75µg/ml and 100µg/ml⁴.

Preparation of standard bacterial suspensions

The minimum number of viable organism of *Staphylococcus aureus* and *Escherichia coli* per ml of stock suspension was found by using surface viable counting technique of colony counter. About 10⁸-10⁹ colonie can be identified. By maintaining constant experimental condition, each time a fresh stock suspension can be prepared.

Antibacterial activity

The antibacterial activity of *Abutilon indicum* was found by cup plate method. It is one of the easiest and economic methods of finding antibacterial activity. The antibacterial activity of methanolic extract was performed using agar cup plate method. 20ml of sterile nutrient agar medium was poured into sterile petriplates and allow solidifying. Four wells were made in the plate (about 5.0mm diameter) using a sterile cork borer and 25µg/ml, 50µg/ml, 75µg/ml and 100µg/ml of the extracts were transferred into the well using a micro pipette. The plates were allowed to stand for 1 hour for the diffusion of the extract to occur and were incubated at 37°C for 24 hours. After incubation for 24 hours, the zone of inhibition around each well in plate were measured by zone reader in mm and recorded⁵.

RESULTS AND DISCUSSION

Table No.1 shows the results of antibacterial activity against the *Staphylococcus aureus* and *E. coli* with different concentrations of methanol extract of *Abutilon indicum* stem bark. All concentrations showed varying degrees of inhibition against both the bacterial strains. 75 (µg/ml) concentration of methanolic plant extract showed higher zone of inhibition as compared with the standard drug against *Staphylococcus aureus* and *Escherichia coli*. Therefore that it is used in treatment of typhoid, diarrhea and dysentery.

Table No.1: Zone of inhibition of extracts and standard against test organisms

S.No	Drugs	Concentration (µg/ml)	Zone of Inhibition (mm)	
			<i>Staphylococcus aureus</i>	<i>Escherichia coli</i>
1	Methanolic Extract	25	13.6	13.3
		50	14.5	18.1
		75	17.1	18.5
		100	16.4	13.5
2	Ciprofloxacin	75	16.9	17.6

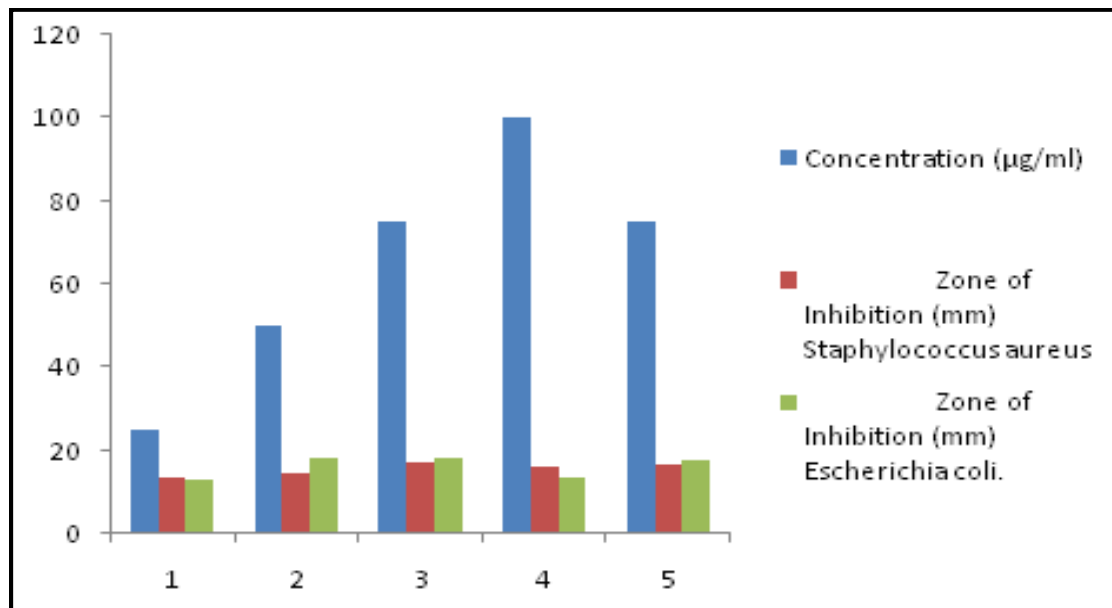


Figure No.1: Zone of inhibition of extracts and standard against test organisms

CONCLUSION

Plant extracts and compounds are of innovative interest as antibacterial agents. As a result, the antibacterial activity of different concentration of medicinal plant parts (*Abutilon indicum*) extracts was screened against the most common pathogens. In general, methanol stem bark extracts of the selected plants appeared to be effective source of active antibacterial agents. However, *Abutilon indicum* stem bark extracts of recorded to possess higher antibacterial activity.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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