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## PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL POTENTIAL OF *ABUTILON INDICUM* (MALVACEAE)

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### ABSTRACT

The present study is carried out to analyze the phytochemical constituents present in the leaves of *Abutilon indicum*. The study revealed the presence of Alkaloids, Flavonoids, Amino acids, Glycosides, Saponins and Steroids. The methanolic leaf extracts were subjected to antimicrobial analysis against human pathogenic microbes. The overall study revealed significant activity against both bacterial and fungal pathogens. The plant could be good source of medicine in future.

**Key words:** *Abutilon indicum*, phytochemical analysis, pathogen and Antimicrobial

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### INTRODUCTION

Plants are integral part of nature. Nature reflects the creative power of living god. Plants have an almost endless variety of uses to human beings. India is birth place of indigeneous medicine such as siddha, Ayurvedha and unani. It is enriched with flora and fauna and therefore the plants have been used since ancient times for treatment of human ailments. In recent years there is an increasing awareness along the masses about the use of herbal drugs which are believed to be safe and does not produce any undesirable effect. The World Health Organization (W.H.O) estimated that 80 % of population of developing countries relies on traditional medicine mostly plant drug for their primary health care needs. Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. Plant produces these chemicals to protect itself but recent research demonstrates that many phytochemicals

can protect humans against various diseases. Today the commercially available antibiotics are becoming ineffective against the pathogens as they develop resistance to it. Hence there is ever increasing urgency throughout the world to find out potential antimicrobial agents. The basic research data available in the form of literature may reduce the time and cost in the searching for new drugs.

*Abutilon indicum* (Malvaceae) is a hairy under-shrub with golden yellow flowers, found in hotter parts of India (Rajakaruna et al, 2002). The plant is very much used in Siddha medicines. In fact, the root, bark, flowers, leaves and seeds are all used for medicinal purposes by Tamils. The leaves are used as adjunct to medicines used for pile complaints. The flowers are used to increase semen in men (Raamachandran, 2007). The plant grows throughout India and in Sri Lanka, at about an elevation of 1000-1, 500 metres. The perennial

shrub grows 1.25-2 metres in height. The leaves are oblong, opposite, toothed, smooth and covered with fine white hair. The flowers are yellow, 2.5 cm in diameter. The fruits are round and have edges on the circumference like a seal, hence called mudra. There are two varieties of atibala, viz. big and small. The plant flowers in June and bears fruits in November.

Traditionally various parts of the plant *Abutilon indicum* Linn. have been used in treating various human ailments. The roots are useful in treating uterine haemorrhagic discharges. Similarly, seeds are used in the treatment of bronchitis, gonorrhoea and piles. Leaves are useful in toothache, lumbago, piles and all kinds of inflammation. Bark is used as anthelmintic, diuretic and alexeteric. In this present study an attempt has been made to study the phytochemical constituents present in the medicinal herb *Abutilon indicum* and its antimicrobial potential against human pathogenic microbes.

## **MATERIALS AND METHODS**

### **Plant material and extraction**

The leaves of *Abutilon indicum* were collected from in and around Coimbatore District, Tamil Nadu, India. The shadow-dried and coarse stem powder (100 g) was successively extracted with methanol using a Soxhlet apparatus. The extracts so collected were distilled on a water bath at atmospheric pressure and the last traces of solvent. The extract was used in Antimicrobial and Phytochemical studies.

### **Screening for phytochemical analysis**

The plant extract was subjected to qualitative tests adopting standard procedures for the identification of the phyto constituents present in it by Harborne (1998) and Kokate et al.,(2003).

### **Antimicrobial studies**

Fresh leaf material (30 g) was weighed, chopped and divided into three portions. Each portion was crushed by grinding in a mortar and transferred to a suitable glass bottle and 50 ml of distilled water was added. First bottle was autoclaved at 80 °C for 20 min, the second was

heated at 100 °C for 20 min and the third was mechanically shaken (200 rpm) in cold temperature for 2 h. The extracts were filtered using cheesecloth and 0.45 µ filter paper and transferred to sterile closed containers. The crude extract was considered as 100% extract. By adding sterile distilled water, 50% of the extract was prepared (Sen and Nandi, 1951). Ethanol extract at different concentrations (100, 75, 50, and 25 mg/ml) were prepared in the same solvents of extraction and tested with solvent controls for antimicrobial activities.

## **RESULT AND DISCUSSION**

The phytochemical analysis and antimicrobial analysis of *Abutilon indicum* was shown in table 1&2. Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. Plant produces these chemicals to protect itself but recent research demonstrates that many phytochemicals can protect humans against various diseases. The phytochemical analysis showed the presence of Alkaloids, Amino acids, Flavonoids, Glycosides, steroids and Saponins. The study plant has been reported as cure for many diseases and the reason for the medicinal property may be because of the presence of these phytochemicals. It is well documented that the presence of these chemicals is responsible for various medicinal properties and reported time to time by various researchers. There are many reports available to support the role of phytochemical constituents and their activity against specific disease (Suresh and Nagarajan, 2011)

The antimicrobial analysis (Table-2.) showed a remarkable activity against the bacterial and fungal pathogens. The maximum activity compared to the control shows the potential of the plant and is an indicator for determining the significance of the activity against the pathogens. The relevance with which increased activity along the increase in concentration may be noted against all the pathogens and a detailed study is required to conclude the exact reason for this. The overall antibacterial analysis reveals maximum against the

*B. subtilis* and minimum activity was noted against the *S. typhi*. Against fungal pathogens activity was maximum towards *Aspergillus niger* and minimum activity was seen against *A. fumigatus*. Overall observation reveals that the plant has inhibitory activity against all the pathogens studied. Since the plant material has broad spectrum of activity

against the microbial strains, this may be used as source of antimicrobial agent as higher plants can serve both as potential antimicrobial crude drugs as well as a source of new anti-infective agents. (Rios, 2005)

**Table-1.** The phytochemical analysis of methanolic leaf extract of *Abutilon indicum*.

Test	Methanol extract
Alkaloids	+
Aminoacids	+
Flavonoids	+
Phenols	-
Steroids	+
Glycosides	+
Tannins	-
Thiols	-
Saponins	+
Fatty acids	-

**Table-2.** The antimicrobial analysis of methanolic leaf extract of *Abutilon indicum*.

Organisms	Concentrations ( $\mu\text{g/ml/Disc}$ )				
	C(mm)	50(mm)	75(mm)	100(mm)	MIC (mg/ml)
	<b>Bacterial Stains</b>				
<i>E. coli</i>	14	9.1	12	12.2	3.0
<i>K. pneumoniae</i>	12	6.3	9.2	11.8	3.0
<i>S. typhi</i>	10	6.9	9.1	9.8	3.0
<i>S. aureus</i>	12.6	7.3	10.1	12.3	3.0
<i>B. subtilis</i>	15	10.5	11.8	13.6	3.0
	<b>Fungal Stains</b>				
<i>Aspergillus niger</i>	15.4	7.5	8	12.2	3.0
<i>A. flavus</i>	11.3	5.5	8.3	10.1	3.0
<i>A. fumigatus</i>	11	6.7	8.5	10	3.0
<i>Candida albicans</i>	12	8.2	8.4	10.3	3.0
<i>Penicillium chrysore</i>	13	8.3	10.4	11.8	3.0

## REFERENCES

1. Rajakaruna N., Cory S., Harris and Towers G.H.N (2002). Antimicrobial Activity of Plants Collected from Serpentine Outcrops in Sri Lanka. *Pharmaceutical Biology* 40, 03 235–244.
2. Raamachandran J. 2007. Herbs of siddha medicines, The First 3D Book on Herbs 4.
3. Sen, S., Nandi, P. 1951. Antibiotics from the Pteridophytes. *Science and Culture*, 16: 328–329.
4. Harborne J.B. *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*. 3<sup>rd</sup> Edition. Chapman and Hall Co. New York. 1998, pp.1-302.

5. Kokate C.K, Purohit A.P and Gohale S.B. Pharmacognosy. Nirali Prakashan Publishers, Pune, India. 2003, pp.1-624.
6. Suresh, S.N. and N. Nagarajan. Phytochemical and antimicrobial activity of methanolic leaf extract of *Swertia bedomei* (Gentianaceae). Jour. P. App. Microbiol. 2011. Vol: 5(2): 1003-1006.
7. Rios JL, Reico MC. Medicinal plants and antimicrobial activity. J Ethnopharmacol 2005; 100: 80-84.

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