

SCREENING OF ABUTILON INDICUM L. LEAF AND SEED EXTRACTS FOR ANTITUBERCULAR ACTIVITY

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ABSTRACT

Plants are known for their diverse pharmacological activities. Plant extracts have been used for centuries as a popular method for treating several health disorders including tuberculosis. The present work has been carried out to find out the Antitubercular activity of *Abutilon indicum* L. (Malvaceae) leaf and seed extracts. The various solvent extracts of *Abutilon indicum* L. were investigated for invitro Antitubercular activity using Microplate Alamar Blue Assay against *Mycobacterium tuberculosis* H37Ra and *Mycobacterium bovis* strains. The present study revealed that the Diethylether, Ethyl acetate and Acetone extracts of leaves, Diethyl ether and Acetone extracts of seeds of *Abutilon indicum* L. are inactive against *Mycobacterium*

tuberculosis H37Ra and *Mycobacterium bovis* strains at a concentration of 100µg/ml.

KEYWORDS *Abutilon indicum* L., anti tubercular activity, solvent extracts, *Mycobacterium tuberculosis* H37Ra, *Mycobacterium bovis*.

INTRODUCTION

Tuberculosis is an infectious disease, caused by several species of mycobacteria. The important human pathogens of this class are *Mycobacterium tuberculosis* and *Mycobacterium bovis*. Tuberculosis (TB) is a major global health problem. Globally in 2014, there were an estimated 9.6 million incident cases of TB: 5.4 million among men, 3.2 million among women and 1.0 million among children.^[1]

The development of multidrug resistance in mycobacteria has further complicated the disease. Thus there is a continuous need for the development of new efficient

antimycobacterial agents to replace those currently in use. Medicinal plants offer a great hope to fulfill these needs and have been used for curing various diseases including tuberculosis.^[2-3]

Abutilon indicum L. leaf extracts exhibited hypoglycemic activity.^[4] antimalarial.^[5], anticarcinogenic^[6], antioxidant^[7], antimicrobial^[8-9], anti-inflammatory^[10], analgesic^[11], hepatoprotective^[12] and diuretic activity^[13]

***Abutilon indicum* L.**

Taxonomic classification

Kingdom : Plantae

Order : Malvales

Family : Malvaceae

Genus : Abutilon

Species : Abutilon indicum

Vernacular names

English - Country mallow, Indian mallow

Hindi - Kanghi, Kakahi

Sanskrit- Atibala, Mahabala

Telugu –Tutturubenda, Duvvenabenda

Tamil -Tutti, Hutti

MATERIALS AND METHOD

Description

Abutilon indicum L. is a medium, branched perennial shrub. It grows upto 2 meters height. Leaves are alternate, cordate and acute. Flowers are yellowish, with 5 petals. Fruits have 15-20 chambers, arranged spirally. Seeds are ovoid or reniform, warty, black or dark brown.^[14]



Figure 1: *Abutilon indicum* L. Plant.

Distribution

The species occurs in a number of tropical and subtropical zones. The plant is found in India, Sri Lanka, tropical regions of America and Malesia.^[15] It can be found in India growing as a common weed along the roadsides.

Plant material

Abutilon indicum L. plants were collected from the region of Nizamabad, Telangana, India, in the month of October. The plant was authenticated by Dr. Vidya vardini, Head of department, Department of Botany, Telangana University.

Preparation of extracts

Leaves extract- *Abutilon indicum* L. leaves were washed in water, shade dried, broken into coarse powder, ground to fine powder using mechanical grinder. Each solvent extract of sample was prepared by soaking 100 g of dried fine powdered samples in 200 ml of respective solvent (Diethyl ether, Acetone and Ethyl acetate) separately for 4 days at room temperature with occasional shaking. The extracts were filtered using Whatman filter paper and then concentrated.

Seeds extract

The fruits of the plant were shade dried until the seeds lose moisture. The seeds were collected and ground to fine powder using mechanical grinder. Each solvent extract of sample was prepared by soaking 100 g of dried fine powdered samples in 200 ml of respective solvent (Diethyl ether and Acetone) separately for 4 days at room temperature with occasional shaking. The extracts were filtered using Whatman filter paper and then concentrated.

Anti tubercular Activity screening

Antitubercular activity of all solvent extracts was tested against the *Mycobacterium tuberculosis* H37Ra and *Mycobacterium bovis* strains using the microplate Alamar Blue assay.

Micro Plate Alamar Blue Assay (MABA)

Test compounds were suspended in 10 % (v/v) DMSO. Two fold serial dilutions of compounds were made in Middlebrook 7H9 medium supplemented with 10% (v/v) ADC, in 96-well plates (Nunc) in duplicate. An inoculum of 10^5 CFU/ml was prepared and 200 μ L

was added per well. Growth controls containing no drug and a sterile control without bacteria were also prepared for each assay. In positive control Rifampicin was added in 2 µg/ml was added in the medium containing bacterial culture. The plates were incubated at 37°C for 5 days before adding 20 µL of sterile 0.01% resazurin to the all wells and incubating for a further 24 h at 37°C. A change in color from blue (oxidized state) to pink (reduced state) indicated growth of the bacteria. The occurrence of color change was observed and fluorescence was measured in a microplate fluorometer in bottom-reading mode with excitation at 530 nm and emission at 590 nm.

RESULTS AND DISCUSSION

The antitubercular activity of plant extracts is shown in Table 1. All the solvent extracts were found to be inactive at 100 µg/ml and at lesser concentrations

Table.1 Antitubercular activity of leaf and seed extracts of *Abutilon indicum* L. against *Mycobacterium tuberculosis* H37 Ra and *M Bovis* (BCG).

Extract/ Concentration		100µg/ml	50µg/ml	25µg/ml	12.5µg/ml	6.25µg/ml	3.125µg/ml
Leaf	Diethyl ether	-	-	-	-	-	-
	Acetone	-	-	-	-	-	-
	Ethyl acetate	-	-	-	-	-	-
Seed	Diethyl ether	-	-	-	-	-	-
	Acetone	-	-	-	-	-	-

(-) Value indicates no activity.

CONCLUSION

The present study revealed that the Diethylether, Ethyl acetate and Acetone extracts of leaves, Diethyl ether and Acetone extracts of seeds of *Abutilon indicum* L. are inactive against the aforesaid mycobacteria at 100 µg/ml concentration. The data of this study may just enrich the existing comprehensive data of *Abutilon indicum* L.

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REFERENCES

1. WHO (World Health Organization). Global tuberculosis report 2015, Geneva, Switzerland, WHO: 2015; 4-5.

2. Abdella Gemechu, Mirutse Giday, Adane Worku and Gobena Ameni. In vitro Anti-mycobacterial activity of selected medicinal plants against *Mycobacterium tuberculosis* and *Mycobacterium bovis* Strains. *BMC Complementary and Alternative Medicine*, 2013; 13: 291.
3. Richard M Mariita, Callistus KPO Ogol, Nick O Oguge, Paul O Okemo. Antitubercular and Phytochemical Investigation of Methanol Extracts of Medicinal Plants Used by the Samburu Community in Kenya. *Tropical Journal of Pharmaceutical Research*, 2010; 9(4): 379-385.
4. Seetharam YN, Chalageri G, Setty SR. Hypoglycemic activity of *Abutilon indicum* leaf extracts in rats. *Fitoterapia*, 2002; 73: 156-159.
5. Rahuman AA, Gopalakrishnan G, Venkatesan P, Kannappan G. Isolation and identification of mosquito larvicidal compound from *Abutilon indicum* (Linn.) Sweet. *Parasitol Research*, 2008; 102: 981-988.
6. Abdul MM, Sarker AA, Saiful IM, Muniruddin A. Cytotoxic and Antimicrobial Activity of the Crude Extract of *Abutilon indicum*. *International Journal of Pharmacognosy and Phytochemical Research*, 2010; 2(1): 1-4.
7. Chakraborty GS. Antioxidant activity of *Abutilon indicum* leaves. *International Journal of Pharm Tech Research*, 2009; 1(4): 1314-1316.
8. Dhirender Kaushik, Sukhbir Khokra L, Pawan Kaushik, Chetan Sharma, Aneja KR. Evaluation of antioxidant and antimicrobial activity of *Abutilon indicum*. *Pharmacology online*, 2010; 1(1): 102-8.
9. Sharma Anjana, Verma Rani, Padmini Ramteke. *World Applied Sciences Journal*, 2009; 7(3): 332-339.
10. Thiripathi P, Chouhan NS, Patel JR. Anti-inflammatory activity of *Abutilon indicum* extract. *Nat Prod Res.*, 2012; 26(17): 1659-61.
11. Ahmed M, Amin S, Islam M, Takahashi M, Okuyama E, Hossain CF. Analgesic principle from *Abutilon indicum*. *Pharmazie*, 2000; 55(4): 314-316.
12. Dash GK, Samanta A, Kanungo SK, Shau SK, Suresh P, Ganpathy S. Hepatoprotective activity of leaves of *Abutilon indicum*. *Indian journal of natural products*, 2000; 16(2): 25-27.
13. Balamurugan G, Selvarajan S, Balakrishnan D, Muralidharan P, Diuretic Activity of *Abutilon Indicum* Linn (Sweet) Seed Extract, *Journal of Herbal Medicine and Toxicology*, 2010; 4(1): 49-52.
14. K. Ramar and V. Ayyadurai. The present investigation deals with in vitro Callus induction and plant regeneration of *Abutilon indicum* (L.). *Journal of Pharmacognosy and phytochemistry*, 2015; 3(6): 248-251.
15. Anonymous, *The Wealth of India: A dictionary of Indian Raw Materials*, Vol. I, CSIR, New Delhi, 1985; 20 -23.