International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 6 Issue 6, September-October 2022 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Evaluation of Leaf and Root Extracts of *Abutilon Indicum* Linn. for Antifungal Activity against Some. Pathogenic Fungi

Harjinder Singh, Shyam Singh

Department of Botany Meerut College, Meerut, Uttar Pradesh, India

ABSTRACT

Weeds are important plants and play an significant role in the field of medicine. Weeds are useless by the view of economy but many plants shows antifungal activity against the pathogenic fungi. In present study the *Abutilon indicum* a weed plant is evaluated for its antifungal activity against some pathogenic fungi. The effect of aqueous and ethanolic extract of leaf and root of *Abutilon indicum* were applied against ***Alternaria alternata***, *Trichoderma korigii, Aspergillus flavus, Fusarium spp.*

The extract were applied at 100 µg/ml; 300 µg/ml and 500 µg/ml. on the fungi and the inhibition has been recorded as the diameter of mycelial growth using well diffusion method. The ethanolic leaf extract showed excellent antimycotic activity as compared to aqueous extract. Compared with control the plant extra performed better at 300 µg/ml. in fungi culture plates and give promising results by significantly reducing the mycelial growth.

KEYWORDS: *bryophyte, medicinal, herbal, antibiotic, diseases, phytochemicals, antitumor, habitats, pharmacological*

How to cite this paper: Harjinder Singh | Shyam Singh "Evaluation of Leaf and Root Extracts of Abutilon Indicum Linn. for Antifungal Activity against Some. Pathogenic Fungi" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-6, October 2022, pp.148-152, URL: www.ijtsrd.com/papers/ijtsrd51839.pdf

IJTSRD51839

1. INTRODUCTION

During the present investigation fungi responsible for disease development in plants have be isolated and the effect of the plant extract is tested on that pathogenic fungi (Gautam et.al.2011)[1].

The herbaceous weed plants contain a number of chemical compounds which are responsible for medicinal activity and are called second day metabolites (Gosh,*et*.al.2005[2], Ganendra,2012[3] ,From the ancient time period. Plant based product has been used for health and to cure the diseases. Whenever such plant material is found to be useful, it is taken for further investigation.

The Meerut district lies between 28°57' to 29°02' North latitude and 77°40' to 77°45 East in Indo genetic plains of India. It is surrounded on North by Muzaffarnagar district, in the South by Hapur and Bulandshahr while Ghaziabad and Bagphat from southern and western limits.

The Leaf and Root Extract of a weed plant *Abutilon indicum* is applied here against the pathogenic fungi. Evaluation of Root and leaf extract effect is done on pathogenic fungi (Ankit Saini 2014)[10] and evaluation of Botanicals against post-harvest fungi pathogens affecting certain vegetables of family solanaceae, (Shyam Singh, Harjinder Singh-2022)[11]Were carried out.

Abutilon indicum Linn.

The *Abutilon indicum* Linn belongs to family malvacae found throughout subtropical of the India.

Classification

Acc. to Bentham and Hooker

Division	–	Phanerogams
Class	–	Dicotyledons
Subclass	–	Polypetalae
Series	--	Thalamiflorae
Order	--	Malvales
Family	-	Malvaceae
Genus	-	*Abutilon*
Species	-	*indicum*

Fig. 1. Overview of *Abutilon indicum* Linn.

Traditional Uses of Abutilon Indicum

All the parts of *Abutilon indicum* are used traditionally for the treatment of various ailments (The Ayurvedic Pharmacopoeia of India) [6]. The roots of the plant are considered as demulcent, diuretic, in chest infection and arthritis. The leaves are found to be good for ulcer and as a fomentation to painful parts of the body. The decoction of the leaves is used in toothache, tender gums and internally for inflammation of bladder. The infusion of the root is prescribed in fevers as a cooling medicine and is considered useful in strangury, haematuria and in leprosy. The bark is used as febrifuge, anthelmintic, alexiteric, astringent and diuretic. The seeds are used in piles, laxative, expectorant, in chronic cystitis, gleet and gonorrhoea. Traditionally the plant is used in inflammation, piles, gonorrhoea treatment and as an immune stimulant. Root and bark are used as aphrodisiac, antidiabetic, nervine tonic, and diuretic. Seeds are used as aphrodisiac and in urinary disorders. Along with other therapeutic applications, The Ayurvedic Pharmacopoeia of India indicates the use of the root in gout, polyuria and haemorrhagic diseases in human beings.

2. MATERIALS AND METHODS

Against pathogenic fungi

Plan of Work

1. Collection and Authentication of plant material
2. Extraction
   a. Extraction with water
   b. Extraction with solvent (ethanol)
3. Evaluation for Antifungal activity

1. Collection and Authentication of Plant Material

The Plant of *Abutilon indicum* Linn. (family-Malvaceae), were collected in the month of August and September from Ganga Nagar Area, Mawana Road, Meerut (U.P) India. Plant was authenticated by Prof R.C. Arya, Department of Botany Meerut College, Meerut (U.P.)

Authentication no. is RUBL

2. Preparation of the extracts

Ethanol & Water Extracts were prepared with the help of Clevenger apparatus.

Ethanol Leaf and root

The shade dried coarse powder of the leaves or roots were added in Clevenger apparatus and were subjected for continuous hot extraction with 99.9% ethanol until the completion of the extraction. The extract was filtered while hot and the resultant extract was distilled in vacuum under reduced pressure in order to remove the solvent completely. Dried and kept in a desiccator till experimentation. Obtained extract was weighed and percentage yield was calculated in terms of air-dried powdered crude material.

Aqueous Leaf and Root:

The shade dried coarse powder of the leaves or roots were added in Clevenger apparatus and was subjected for continuous hot extraction with distilled water until the completion of the extraction. The extract was filtered while hot and the resultant extract was distilled in vacuum under reduced pressure in order to remove the solvent completely. Dried and kept in a desiccator till experimentation. Obtained extract was weighed and percentage yield was calculated in terms of air-dried powdered crude material.

$$\text{Percentage yield} = \frac{\text{Weight of Extract} \times 100}{\text{Weight of powder drug}}$$

3. Evaluation for Antifungal Activity Against Pathogenic Fungi:

Material required

Std. Drug- Griseofulvin (50µg/ml)

Alcoholic and aqueous extracts at different concentration were used for antifungal study (Gautam et. al.2011)[7] and Jigna Parekh, 2008)[9]. Well diffusion method was used for antifungal screening. The antifungal activity was expressed as zone of diameter in millimetres shown in table. Griseofulvin was used as standard drug. Used fungal stain names were as follow.

A. *Alternaria alternata*
B. *Trichoderma Korigii*
C. *Aspergillus flavus*
D. *Fusarium* sp.

Preparation of medium

3.9g Potato-Dextrose Agar (Hi-Media) was added in 100 ml of distilled water along with different concentrations (100µg, 300µg and 500 µg) of alcoholic or aqueous plant extract (which were extracted by Clevenger Method), and finally autoclaved at 15 lb/inch2 for 15 minutes. After autoclaving and cooling (about 45 0 C), it was poured

into previously sterilized Petri plates. The pert plates were inoculated with the apical part of 7 days old experimental fungal mycelium. All Petri plates were kept into the incubator chamber at 28^0C.

Preparations of Control Medium:

In controls, first the PDA medium without plant extract and inoculated with same fungus, in second, standard antifungal agent (griseofulvin) at the rate of 50µg/ml was added and inoculated with same fungal isolates (Kauskik et. al.2009)[8].

Antifungal Activity

Antifungal activity was determined by comparing the experimental and control plates (i.e. Diameter of fungi in control plate - diameter of fungi in experimental plate). Zone of inhibition is also expressed by following formula.

$$ZOI = \frac{(control - experimental)}{Control} \times 100$$

3. Results and Discussion

Yields of various solvents extracts

The Photochemical screening of various extracts obtained by extraction using Clevenger apparatus, the yields of various extracts were found as given below:

Table 1: Extraction values of Abutilon indicum leaf

Extract	Yield (GM)	% W/W
Alcohol Soluble Extract	4.4	21.8
Water Soluble Extract	4.9	24.5

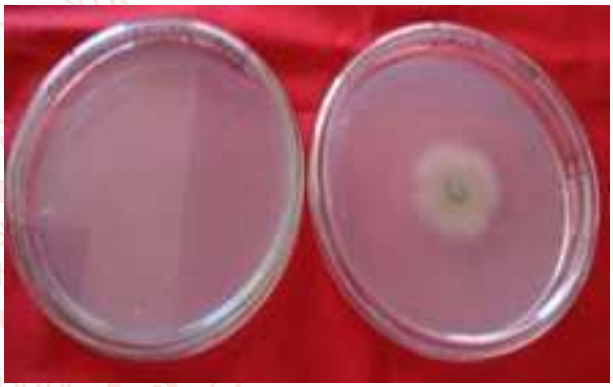
Table 1: Extraction values of Abutilon indicum root

Extract	Yield (GM)	% W/W
Alcohol Soluble Extract	3.4	18.8
Water Soluble Extract	4.15	20.8

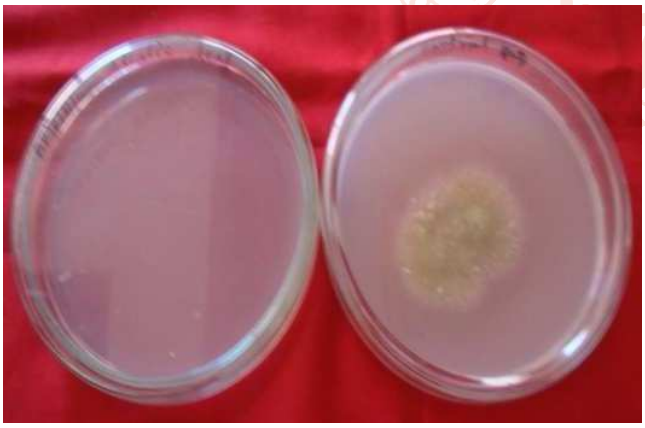
Antifungal activity of Leaf Extract:

Fungal Pathogen- *alternaria Alternata* of *Abutilon Indicum*, *Aspergillus flavus*, *Fusarium* Sp., derma Korigii. Std. Drug - Griseofulvin

[A]-*Alternaria alternate*



[B]-*Trichoderma Konigii*



[C]-*Aspergillus flavus*

[D]-*Fusarium Sp.*

Figure 2: Antifungal activity of alcoholic leaf extract

A – Antifungal activity on *Alternaria Alternata*

B - Antifungal activity on *Trichoderma Konigii*

C - Antifungal activity on *Aspergillus flavus*

D - Antifungal activity on *Fusarium Sp*

Table 3 Zone of Inhibition in millimeter

S. No	Fungi	Concentrations of alcoholic leaf extract			Concentrations of aqueous leaf extract			Griseo fulvin
		100 µg/ml (ZOI mm)	300 µg/ml (ZOI mm)	500 µg/ml (ZOI mm)	100 µg/ml (ZOI mm)	300 µg/ml (ZOI mm)	500 µg/ml (ZOI mm)	
1.	*Alternaria Alternata*	01	06	14	nil	nil	Nil	27
2.	*Trichoderma Konigii*	02	08	12	nil	nil	Nil	25
3.	*Aspergillus flavus*	Nil	nil	nil	nil	nil	Nil	30
4.	*Fusarium Sp.*	Nil	nil	nil	nil	nil	Nil	31

Antifungal activity of Root Extract of *Abutilon Indicum*

Table4. Zone of Inhibition in millimeter

S. N.	Fungi	Concentrations of alcoholic Root extract			Concentrations of aqueous Root extract			Griseo fulvin
		100 µg/ml (ZOI mm)	300 µg/ml (ZOI mm)	500 µg/ml (ZOI mm)	100 µg/ml (ZOI mm)	300 µg/ml (ZOI mm)	500 µg/ml (ZOI mm)	
1.	*Alternaria Alternata*	Nil	01	03	nil	nil	nil	28
2.	*Trichoderma Konigii*	Nil	03	04	nil	nil	nil	27
3.	*Aspergillus flavus*	Nil	nil	nil	nil	nil	nil	29
4.	*Fusarium Sp.*	Nil	nil	nil	nil	nil	nil	31

The result of antifungal activity it may be concluded that alcoholic leaf extract have positive and good response against *Alternaria altenata and Trichoderma Konigii*. But the aqueous leaf extract has not shown the any antifungal activity the aqueous and alcoholic root extract has not shown the effective Antifungal activity of *Ablution indicum.*

Conclusion

In this study of *Abutilon indicum* was extracted by different solvents for finding various constituents present in the plant extract. The % yield alcohol & water extract of root was found to be 18.5% & 20.5% w/w respectively. The % yield alcohol & water extract of leaf was found to be 21.8%, 24.5% w/w respectively. From the experiment and results of antifungal activity it may be concluded that alcoholic leaf extract have positive & good response against *Alterneria alternata and Trichoderma konigii*. But the aqueous leaf extract has not shown the antifungal activity. In another case the aqueous & alcoholic root extract has not shown the Antifungal activity against the pathogenic fungi.

REFERENCES

[1] Gautam, Girendra Kumar, and G. Vidyasagar. "Physicochemical and preliminary phytochemical screening of Salvadora oleoides Dene. (root bark) and Salvadora persica Linn. (root bark)." *International Journal of Drug Discovery and Herbal Research*, 1. 2 (2011): 91-94.

[2] Ghose D. and Laddha K, Herbal Drug Extraction: An Update Chemical Weekly, (2005): 185-190

[3] Girendra Kumar Gautam, G. Vidyasagar, S. C. Dwivedi. Study on Medicinal Plants from Indian Origin, Lambert Academic Publishing (LAP), Germany, (2012)

[4] 70en.wikipedia.org/wiki/*Abutilonindicum*. (Accessed on Feb. 2013.

[5] Gautam, Girendra Kumar et al. "Anti-Diabetic Activity of Aqueous and Methanolic Extract of Abutilon Muticum." *International Journal Pharmacy Teaching & Practice,* 4. 1 (2013): 522-526.

[6] The Ayurvedic Pharmacopoeia of India, Part-I, Vol. 1. Sahacara (Whole plant): 25-28.

[7] Gautam Girendra Kumar, and Vidhyasagar Gali. "Phytochemical screening of abutilon muticum (del. Ex dc.) and celosia argentea linn." *International Journal of Pharma & Bio Sciences* 2. 3 (2011): 463-467

[8] Kaushik P, Kaushik D, Khokra S, Chudhary B, *Abutilon indicum* (Atibala) Ethanobotany, Phytochemistry and pharmacology-A Review. *Int. J. of Pharmaceutical and Clinical research*, 1. 1 (2009): 4-9.

[9] Jigna Parekh and Sumitra Chanda, In vitro antifungal activity of methanol extracts of some Indian medicinal plants against pathogenic yeast and moulds. *African Journal of Biotechnology*, 7. 23 (2008): 4349-4353.

[10] Ankit Saini et al. (2014) Evaluation of Root and stem extract of *Abutilon indicum* Linn. for Antifungal activity. Int. Jour of Chemistry and Pharm. Science (IJPCS)-Vol. 2(3) 717-721.

[11] Shyam Singh and Harjinder Singh (2021) Evaluation of Botanicals against Post harvest Fungal Pathogens Affacting contain vegetables of Family solanaceae IJTSRD Vol 5 (6) PP-1900-1903.