Advances in Bioresearch
Adv. Biores., Vol 14 (1) January 2023: 221-224

Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.14.1.221224

Advances in Bioresearch

ORIGINAL ARTICLE

Anthelmintic Potential of Alcoholic Extract of *Abutilon indicum* Linn

Swaliha C K*, Sarmila S, Manoj Kumar M, Praveen Kumar S, Satheesh P, M Surendra Kumar
Department of Pharmacology, Senghundhar College of Pharmacy, Kumaramangalam, Namakkal District, Tamil Nadu, India-637205
*E mail: swalihack@gmail.com

ABSTRACT
The main goal of the current study was to assess the anthelmintic potential of the whole Abutilon indicum Linn plant. In ethnomedicine, numerous ailments are treated using various plant parts. The phytochemical investigation revealed steroids, alkaloids, saponins, amino acids, flavonoids, and glycosides in the plant material. This plant seems to have a number of possible pharmacological properties. There have been numerous pharmacological studies and wide extend of biological activities have been observed including anti-inflammatory, anti-hyperlipidemic, anti-microbial, wound healing and anti-diarrheal activities. Anthelmintic activity was performed using ethanolic extract of whole plant was tested against Lumbricus terrestris (earthworm) in in vitro condition using various concentration ranges from 10 to 50 mg/ml. The activity of the extract against Lumbricus terrestris was close to that of standard drug piperazine citrate.
KEY WORDS: *Abutilon indicum* (L.), Medicinal plant, Anthelmintic, *Lumbricus terrestris*.

Received 19.10.2022 Revised 05.11.2022 Accepted 22.11.2022

How to cite this article:
Swaliha C K, Sarmila S, Manoj K M, Praveen K S, Satheesh P, M Surendra Kumar. Anthelmintic Potential Of Alcoholic Extract Of *Abutilon Indicum* Linn. Adv. Biores. Vol 14 [1] January 2023.221-224

INTRODUCTION

For thousands of years, herbs have been the primary source of medicine. They have historically primarily relied on herbal cures to serve as prevalent folk medicines[1]. Traditional medicines are largely derived from natural sources. Abutilon indicum is a plant that is indigenous to South Asia and is commonly referred to as "Thuthi" or "Kanghi" in Hindi. About 150 annual or perennial herbs, shrubs, or even tiny plants of Abutilon genus belong to the Malvaceae family, which are found across the tropical and subtropical regions of America, Africa, Asia, and Australia[2]. *Abutilon indicum* has both medicinal and ornamental properties. Fever can be treated with its roots and leaves. The plant Abutilon indicum is widely distributed, including in Bangladesh, India, Pakistan, and Sri Lanka[3]. The plant is considered as antibacterial, anti- inflammatory, antioxidant, demulcent, astringent, anthelmintic, carminative and diuretic. It is used locally for high fever, cold, tuberculosis, bronchitis, mumps, diabetes, hernia, hemorrhoids, diarrhoea and various types of worm infections[4]**.** Plants are a vital and integral part of the world of prescription medicine as they can produce a wide range of bioactive substances, including flavonoids, proteins, alkaloids, steroids, glycosides, Phyto sterols, phenolic compounds, carbohydrates, amino acids, saponins and glycosides, which are then used to treat a wide range of illnesses, such as body aches, bronchitis, piles, diabetes, fever, leprosy, cystitis, ulcers, gonorrhoea, diarrhoea , cough, urine output, lung disease etc[5]. In addition, they are used to treat cough, mumps, pulmonary tuberculosis, high fever, deafness, and ringing in the ears. In ayurvedic treatments for haemorrhoids, diabetes, and menorrhagia, the entire herb is employed. A. indicum leaf extracts exhibit hypoglycemic action in rats[6].

MATERIAL AND METHODS

Collection and Authentification of *Abutilon indicum* Linn

The whole plant of *Abutilon indicum L.* was collected on November from local areas of Tiruchengode, Namakkal District. The plant was recognized and authenticated (Specimen No.

BSI/SRC/5/23/2022/Tech/543) by Botanical Survey of India, Southern regional centre, T.N.A.U Campus, Lawley road, Coimbatore-641 003.

Preparation of extracts

The fresh whole plant of *Abutilon indicum* was washed with distilled water to get rid of dust particles. The whole plant was shade dried, pulverized and passed through 60 mesh size sieves. 100gms of powdered drug was weighed accurately and extracted with ethanol using cold maceration method.

Filtered the extract through Muslin cloth. Filtrate was evaporated to a semisolid consistency and then air dried and stored at room temperature in a desiccator[7]

Preliminary phytochemical screening

Using the standard phytochemical methodologies, the alcoholic extract of Abutilon indicum was examined for the presence of several secondary metabolites.

1. Test for Alkaloids: A little fraction of the extract was filtered to screen for alkaloids after being agitated with a few drops of hydrochloric acid using various alkaloidal testing reagents, including

Mayer's test: The presence of an alkaloid can be detected by adding a few drops of Mayer's reagent (potassium mercuric iodide) to the alcoholic extract solution. This results in a creamy white precipitate.

Dragandroff's test: A few drops of the Dragandroff reagent (potassium bismuth iodide) are added to the alcoholic extract solution, the mixture should become orange-red, indicating the presence of an alkaloid.

Wagner's test: Add a few drops of Wagner's reagent, which is an iodine-in-potassium-iodide liquid, to the alcoholic extract solution to produce a brown precipitate[8].

2.Test for flavonoids:

Alkaline reagent test: The presence of flavonoids was detected by adding a few drops of sodium hydroxide to 2 ml of the alcoholic extract solution, which produced a bright yellow colour that turned colourless when a few drops of diluted acetic acid were added.

Shinoda's test: Five minutes of heating an alcoholic extract with a small amount of magnesium and a few drops of highly concentrated HCl results in a reddish colour, which indicates the presence of flavonoid [9].

3. Test for Tannins

Ferric chloride test: In a test tube, 10ml of water were used to boil about 0.5g of the alcohol extract, which was then filtered. The addition of a few drops of 0.1% ferric chloride was followed by an examination for bluish green coloration.

Gelatin test: The alcoholic extract is mixed with an aqueous solution containing 10% sodium chloride and 1% gelatin. A whitish, buffy precipitate develops, indicating the presence of tannins.

Phenazone test: Mix 5ml of alcoholic extract with 0.5g of sodium acid phosphate, warm, cool, and then filter. To obtain bulky coloured precipitate, mix the filtrate with 2% Phenazone solution.

Vanillin HCl test: Abutilon indicum alcoholic extract was treated with a few drops of vanillin HCl; Pink colour was produced by the conversion of catechin to phloroglucinol[10].

4. Test for phenol: 3–4 drops of ferric chloride solution should be added to 2 ml of the extract. Phenol can be detected by the appearance of a blue black colour [11].

5. Test for carbohydrate:

Molisch test: Add a few drops of α-naphthol solution to the extract. A few drops of strong sulfuric acid were introduced to the test tube on the side. A ring of purple to violet colour can be detected at the junction of the two layers.

Benedict's test: To the extract, add a few drops of Benedict's reagent (alkaline solution of cupric citrate complex). The emergence of a reddish-brown colour indicate the presence of reducing sugars.

Seliwainoff's test: Add few ml of extract add drops of Seliwainoff's reagent and boil. Red coloured compound develops[12].

6.Test for glycosides:

Bontrager's test: Hydrosalate was extracted with benzene after a tiny amount of the extract was hydrolyzed with HCl for a few minutes on a water bath. The benzene layer developed a reddish pink colour after being exposed to a diluted ammonia solution.

Legal Test: After being dissolved in pyridine and made alkaline with a few drops of 10% NaOH, the extract was combined with freshly prepared sodium nitroprusside solution while being observed for the appearance of a blue colour [13].

7. Test for Steroids and Triterpenoids

Libermann-Butchard test: Add a few drops of acetic anhydride to the extract. Prior to cooling, boil the contents. Sulphuric acid concentrate is added to the test tube's walls. Triterpenoids are observable when the upper liquid layer turns green and a brown ring develops at the intersection of two liquid layers.

Salkowsi test: The extract is mixed with a few drops of strong sulfuric acid and chloroform. Shake vigorously and allow to stand for some time. Triterpenoids are present when yellow colour forms at the lower layer, while steroids are present when red colour forms at the lower layer [14].

Anthelmintic potential of *Abutilon indicum*

Chemicals and drugs Required

Piperazine citrate- Standard drug
Ethanol
Distilled water
Saline water

Alcoholic extract of *Abutilon indicum* whole plant was evaluated for their anthelmintic action against *Lumbricus terrestris.* Various concentrations of extract were assessed in the bioassay, which involves monitoring the duration for worm's paralysis as well as death. Saline was used as control, while piperazine citrate was used as the reference standard. The investigation's experimental design includes eleven groups of two worms each, and it was performed in accordance with the following regimen[15]

Group 1: Normal saline
Group 2: Piperazine citrate 10mg/ml
Group 3: Piperazine citrate 20mg/ml
Group 4: Piperazine citrate 30mg/ml
Group 5: Piperazine citrate 40mg/ml
Group 6: Piperazine citrate 50mg/ml
Group 7: Alcoholic extract of the whole plant 10mg/ml
Group 8: Alcoholic extract of the whole plant 20mg/ml
Group 9: Alcoholic extract of the whole plant 30mg/ml
Group 10: Alcoholic extract of the whole plant 40mg/ml
Group 11: Alcoholic extract of the whole plant 50mg/ml

By monitoring the duration that it takes for individual worms to become paralysed and die up to five hours of test period, can determine the anthelmintic activity. Each extract's mean paralysis and lethal times were noted. When worms failed to revive even in normal saline, paralysis is thought to have occurred. The worm was declared dead when it lost its ability to move, which was followed by the fading of its body colour. [16].

RESULTS

Abutilon indicum showed in vitro anthelmintic action in the current investigation. The presence of biologically active constituents in ethanolic extract including alkaloid, tannins, flavonoid, phenols, glycoside and steroids in ethanolic extract are shown in (table I). The ethanolic extract was tested against earthworm*, Lumbricus terrestris*. The period of time it takes for the parasite to become paralysed at various concentrations of whole plant extract were depicted in table II. Both the paralytic and the time it takes for complete inactivation have dose-dependent action. The organism becomes paralysed after 31.5±2.121 minutes and dies after 39.5±2.121minutes at a concentration of 50mg/ml and which is comparable with that of standard drug piperazine citrate. These results revealed that the ethanol extract of *Abutilon indicum* has adequate anthelmintic activity.

Table I: Preliminary qualitative chemical test

Sl.no	Constituents	Alcoholic extract of *Abutilon indicum*
1	Alkaloids	+ +
2	Flavonoids	+
3	Tannins	+
4	Phenols	+
5	Carbohydrate	_
6	Glycoside	+
7	Steroids	+

(++) indicate active constituents in high amount in the *Abutilon indicum* extract.
(+) indicate active constituents in moderate amount in the *Abutilon indicum* extract.
(-) indicate the absence of active constituent.

DISCUSSION AND CONCLUSION

Abutilon indicum whole plant alcohol extract was evaluated for its anthelmintic potential against *Lumbricus terrestris.* The present study makes it clear that Abutilon indicum's alcoholic extract contains

promising anthelmintic bioactive substances like flavonoids, alkaloids, tannins, and phenols. Hence, the paralysis and death of the parasite is brought on by the alkaloids and phenolic compounds found in the alcoholic extract of the whole plant of *Abutilon indicum*[17].

We concluded from the findings that *Abutilon indicum* Linn has remarkable anthelmintic action and can be exploited as a lead molecule in the development of novel drugs.

Table II: Anthelmintic activity of Alcoholic extract of whole plant compared with Piperazine citrate as standard

Treatment	**Concentration (mg/ml) of extract**	**Time taken for paralysis (min)**	**Time taken for death (min)**
Normal saline	-	-	-
Piperazine citrate	10	131±1.414	137±3.535
	20	79±1.414	99±2.824
	30	34.5±2.121	93.5±3.535
	40	27.5±2.122	41.5±2.121
	50	22±2.121	32.5±2.121
Alcoholic extract of *Abutilon indicum* whole plant	10	153±2.828	178±1.414
	20	118.5±2.121	137±1.414
	30	42.5±2.121	103.5±2.121
	40	33.5±2.121	57.5±2.121
	50	31.5±2.121	39.5±2.121

REFERENCES

1. Sathyaprabha G, Kumaravel S, Ruffina D, Praveenkumar P: (2010). A comparative study on antioxidant, proximate analysis, antimicrobial activity and phytochemical analysis of *Aloe vera* and *Cissus quadrangularis* by GC-MS. J Pharma Res ; 3:2970-3.
2. Rajeshwari S, Sevarkodiyone SP. (2019). Medicinal properties of Abutilon indicum. International Journal of Research In Phytochemical And Pharmacological Sciences. 1(1):1-4.
3. Kandepalli M, Wakale S. (2021). Antimicrobial activity of abutilon indicum–a medicinal plant. European Journal of Molecular & Clinical Medicine. 15;8(1):1725-9.
4. Edupuganti S, Gajula RG, Kagitha CS, Kazmi N. (2015). Antimicrobial activity of Abutilon indicum. World J. Pharm. Pharm. Sci. 1;4(1): 946-9.
5. Sohel, Md Didaruzzaman.(2015). "Pharmacologicals and phytochemicals potential of Abutilon indicum: A Comprehensive Review." American Journal of BioScience 3.2-1 (1): 5-11.
6. Saraswathi R, Upadhyay L, Venkatakrishnan R, Meera R, Devi P. (2011). Phytochemical investigation, analgesic and anti inflammatory activity of Abutilon indicum Linn. Int J Pharm Pharm Sci. 3(1):154-6.
7. Patil P, Patel JK, Kulkarni PS, Patel MU, Bhavsar CJ, Patel JA. (2010). In vitro anthelmintic activity of various herbal plants extracts against Pheritima posthuma. Research Journal of Pharmacognosy and Phytochemistry. 2(3):234-7.
8. Yadav RN, Agarwala M. (2011). Phytochemical analysis of some medicinal plants. Journal of phytology. 14;3(12).
9. Harborne JB. (1980). The flavonoids: advances in research since 1980.
10. Trease GE, Evans WC. (1989). Pharmacognsy. 11th edn. Brailliar Tiridel Can.
11. Parekh J, Chanda S. (2007). In vitro antimicrobial activity and phytochemical analysis of some Indian medicinal plants. Turkish Journal of Biology. 31(1):53-8.
12. Banu KS, Cathrine L. (2015). General techniques involved in phytochemical analysis. International journal of advanced research in chemical science. ;2(4):25-32.
13. pawar. Sunil; Kamble, Vanita(2017). Phytochemical Screening, Elemental And Functional Group Analysis Of Vitex Negundo L. Leaves. *International Journal of Pharmacy and Pharmaceutical Sciences,* 9(6), 226.
14. Amir MK, Rizwana AQ, Faizan U, Syed AG, Asia N, Sumaira S, Muhammad KL, Muhammad YL, Ishtiaq H, Waheed M. Phytochemical analysis of selected medicinal plants of Margalla Hills and surroundings. Journal of medicinal plants research. 2011 Nov 9;5(25):6055-60.
15. Ajaiyeoba EO, Onocha PA, Olarenwaju OT. (2001). In vitro anthelmintic properties of Buchholzia coriaceae and Gynandropsis gynandra extracts. Pharmaceutical biology. 1;39(3):217-20.
16. Ranjit PM, Chowdary YA, Krapa H, Nanduri S, Badapati H, Kumar KP, Bommadevara P, Kasala M. (2013). Antimicrobial and antihelminthic activities of various extracts of leaves and stems of Abutilon indicum (Linn.). International Journal of Pharmaceutical and Biological Archive. 4(1):235-9.
17. John J, Mehta A, Shukla S, Mehta P.(2009). A report on anthelmintic activity of *Cassia tora* leaves. Songklanakarin J Sci. Technol. 31(3):269-271.