



A STUDY ON INVITRO EVALUATION OF ANTIHELMINTIC ACTIVITY OFN-HEXANE AND 1-BUTANOL EXTRACTS OF *ACHYRANTHES ASPERA* LEAVES AGAINST *PHERITIMA POSTUMA*

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ABSTRACT:

Helminthic infections are among the most widespread infection in humans that cause severe morbidity. It is one of the most serious problems in the developing countries. Traditional plant-based remedies continue to be an important therapeutic aid for treating parasitic infections. Gastrointestinal worms are hardy. Currently available anti-helminthic drugs and the high cost of conventional anti-helminthic make medicinal plants to be evaluated as alternative sources of anti-helminthic drugs. In this study 1-butanol and n-hexane extracts of *Achyranthes aspera* leaves were conducted to evaluate the potential anthelmintic effect of the extract. Anti-helminthic activity against the earthworm *Achyranthes aspera* was tested at concentrations of 10 mg/ml, 20 mg/ml of both extracts. The results were expressed as paralysis time and death time of the worms. 1-Butanol at 20 mg/ml concentration showed better anti-helminthic activity compared to standard drug.

Keyword: *Achyranthes aspera*, anti-helminthic activity, Traditional plant-based remedies.

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INTRODUCTION TO *ACHYRANTHES ASPERA*:

Achyranthes aspera is an erect, many-branched, spreading, and quadrangular herb that lives several years. The plant can grow up to 6 to 7 feet tall, commonly known as chaff flower, prickly chaff flower, devil's horsewhip. The plant and its all parts like root, seeds, leaves, roots, flowers, and fruits have been used for the medicinal purpose; 21 leaves of the *Achyranthes aspera* regularly used in Ganesh Patra pooja on Ganesh Chaturthi.

The leaves of *Achyranthes aspera* are simple, hairy, shorty stalked. The leaves have two colours, i.e. yellowish below and green above, situated opposite each other on a sharp- pointed woody stem. The leaves are 8 to 10 cm long, 7 to 8 cm wide with a broad base and pointed tip like an egg. *Achyranthes aspera* has small green/yellowish-white flowers which form narrow, long spikes; it grows up to 60 cm long. By the time flowers bend towards the stem, in the fruiting stage, The bracts around the flowers become sharp, pointed tips making the heads spiny to the touch, fruits are orange to reddish-purple or straw-brown capsules.



FIG -1: *Achyranthes aspera* Plant

Scientific Classification:

Kingdom: Plantae

Sub kingdom: Tracheobinota

Super Division: Spermatophyta

Division: Mangoliophyta

Class: Mangoliophsida

Sub class: Caryophyllidae

Order: Caryophyllales

Family: Amaranthaceae

Genus: Achyranthes

Species: Aspera

Vernacular Names:

Latin: *Achyranthes aspera*

English: Prickly Chaff flower, Rough chaff tree, Red chaff tree

Sanskrit: Aghata

Hindi: Latjira, Chirchira

Gujarati: Safed Aghedo

Tamil: Shiru-kadaladi

Telugu: Uttarane

Malayalam: Kadalad

Punjabi: Kutri

Unani: Chirchitaa

Ayurvedic: Shaikha, Apaamaarga, Chirchita, Shikhari

AIMS AND OBJECTIVES

selection and collection of leaves of *achyranthes aspera* plant for anti-helminthic activity the leaf extract of *achyranthes aspera* was collected by soxhlation technique using n-hexane as solvents. evaluation anti-helminthic activity of n-hexane extract and butanol extract of *achyranthes aspera* leaves. the results were compared with standard drug (positive control) of *achyranthes aspera* plant for anti-helminthic activity.

MATERIALS AND METHODS:

Collection of *achyranthes aspera* leaves:

The leaves were collected from the remote areas of Karimnagar district.

Plant authentication: The plant was taxonomically identified and authenticated as *achyranthes aspera* by Dr. A.H. Naqvi, Department of Botany, SRR Govt. Degree college, Karimnagar, Telangana.

Various extractions of drug: The dried powered of leaf material of *achyranthes aspera* was extracted with n-hexane and butanol using Soxhlet apparatus. After exhaustive extraction the collected n-hexane extract and butanol extracts were subjected to evaporation to obtain the pure extract .n-hexane and 1- butanol extraction was performed separately.

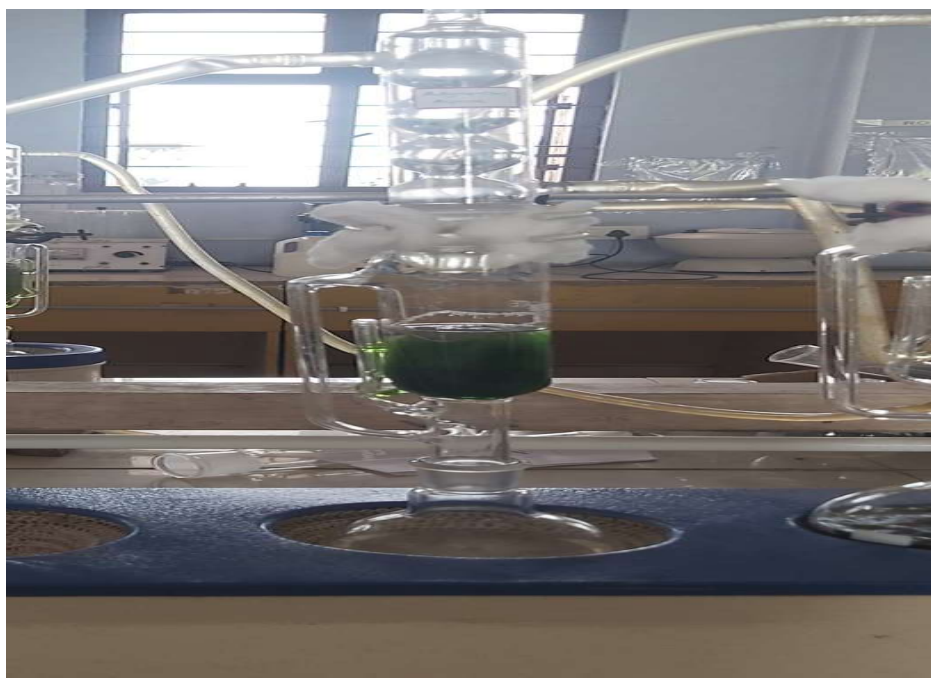


FIG -2: Soxhlet Extractor Process of *Achyranthes aspera* Plant Leaves Powder

The plant material is placed inside a thimble made from thick filter paper, which is loaded into the main chamber of the Soxhlet extractor. This extractor is placed on to a distillation flask containing solvent. The Soxhlet is then equipped with a condenser, and the solvent is heated to reflux. The warm solvent vapor travels up a distillation arm and floods into the chamber through the thimble. When the chamber is

almost full, it gets automatically emptied by a siphon side arm back down to the distillation flask. This cycle may be allowed to repeat many times so that the entire contents of the crude drug gets extracted to and round bottom flask desired compound gets concentrated in the distillation flask. Then the solvent extracts are filtered and saved.

RESULTS OF PHYTOCHEMICAL SCREENING:

The n-hexane extract and 1-butanol extract contains Alkaloids, Tannins, Phenolic, Saponins, Flavonoids, Sterols, Glycosides.

Table 1: Result of Phytochemical Screening

Chemical Constituents	Extract Of 1-Butanol	Extract Of N-Hexane
Carbohydrates	–	+
Amino acids	+	+
Alkaloids	+	+
Saponins	+	+
Flavonoids	+	+
Tannins	+	+
Phenolics	+	+
Phytosterols	+	-
Glycosides	+	-

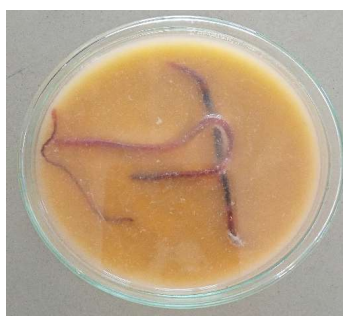
ANTIHELMINTIC ACTIVITY :

The anti-helminthic activity was evaluated on adult Indian earthworms by Mathew. For preliminary evaluation of anthelmintic activity test samples of the extract was prepared at the concentration of 10, 20 mg/ml in Tween 80 (1%) solution diluted with normal saline and 6 worms *Pheretima posthuma* of 8-10cm were placed in Petri dish containing 20 ml of above test solutions of extracts. Albendazole (10, 20 mg/ml) was used as reference standard and normal

saline with Tween 80 (1%) is used as negative control. All the test solutions and standard solutions were prepared freshly before starting the experiment. Observations are made for the time taken for paralysis when movement was lost or no movement. Worms should not relieve even in normal saline. Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water and fading of color of worms.



Albendazole drug 10mg/ml



Albendazole drug 20mg/ml



N-Hexane extract 10mg/ml



N-Hexane extract 20mg/ml



1-Butanol extract 10mg/ml

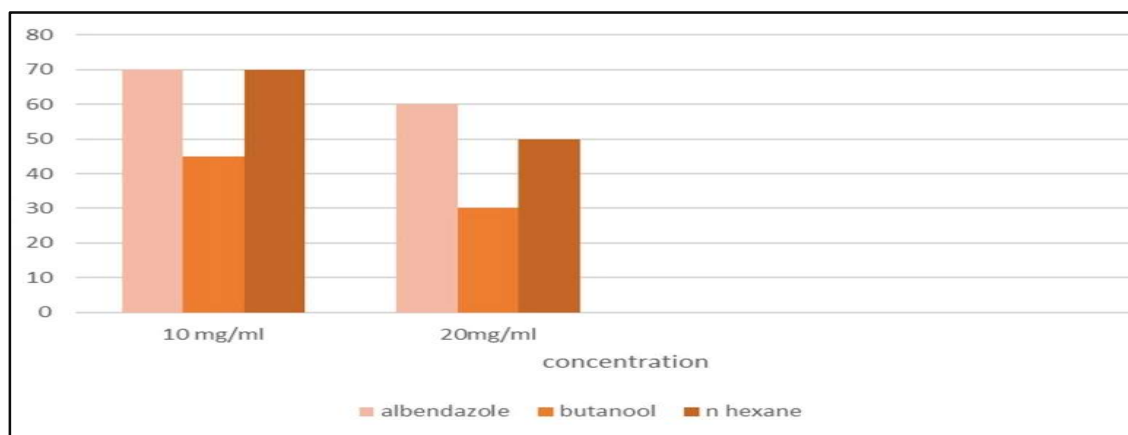


1-Butanol extract 20mg/ml

FIG -3: Results Of *Achyranthes aspera* leaves extract of anti-helminthic activity using *pheritima posthuma*.

TABLE NO.2: RESULTS OF ANTI-HELMINTHICACTIVITY:

Plant extract	Concentration (mg/ml)	Time of paralysis in min	Time of death in min
Tween80	1%	160	170
Albendazole	10	50	70
	20	40	60
1-butanol	10	40	45
	20	25	30
n-hexane	10	60	70
	20	45	50

FIG -4: Bar Graph of anti-helminthic activity of *Achyranthes aspera***DISCUSSION:**

In the present study it was observed that, all the extracts have shown positive response certain degree of anti-helminthic activity, whereas 1-butanol extract had shown significant activity compared to other extracts where it took 25 mins for paralysis and 30 min for death for 20 mg/ml. 1-butanol extract exhibited significant activity then n-hexane extract and standard drug albendazole. Phytochemical screening revealed the presents of alkaloids, tannins,

flavonoids, sterols. Which may be responsible for anti-helminthic activity.

CONCLUSION:

In conclusion, it is revealed that the 1-butanol and n-hexane extracts obtained from the leaves of *Achyranthes aspera* possess anti-helminthic activity, but the Butanol extract showed enhanced anti-helminthic activity when compared with the n-hexane extract and standard drug, Albendazole. In order to confirm the above results, the in vivo studies must be conducted.

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CONFLICT OF INTEREST REPORTED: NIL; SOURCE OF FUNDING: NONE REPORTED