

Preliminary Phytochemical Analysis and *In vitro* Anti-helmenthic activity of *Achyranthes aspera* Leaf extract

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ABSTRACT

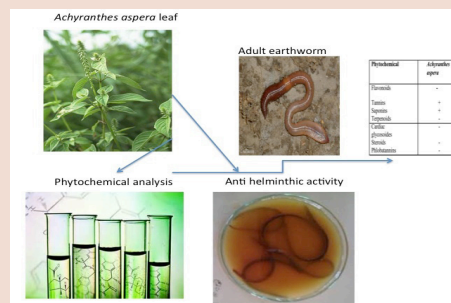
Objective: To evaluate the preliminary phytochemical analysis and *in vitro* Antihelmenthic activity of leaf extract of *Achyranthes aspera*. **Background:** *Achyranthes aspera* is an annual, stiff-erect herb found commonly as a weed throughout India. The leaf ethyl acetate extract showed high larvicidal activity on the tick larvae of Rhipicephalus. It strengthen the liver and kidneys, strengthening muscles, tendons and bones, anti-inflammatory, anti-toxin, urine laxative, normalize menstruation, hemostatic, ease childbirth. Chemical Ingredients includes Akirantin, glokosa, galactose, reilosa, ramnosa, and alkaloids. Hentriakontan, sapogenin, Betaine, ecdysterone, triterpenoid saponins. **Methods:** Preliminary phytochemical analysis was done by adopting the method of Evans. Antihelmenthic assay is performed by standard protocol. **Result:** The present study reveals the presence of few secondary metabolites and the extract exhibits potent Antihelmenthic activity. **Conclusion:** From the present study it can be concluded that *Achyranthes aspera* leaf extract possessed marked *in vitro* Anti helminthic effect.

Key words: *Achyranthes aspera*, Anti-helmenthic, Anti-inflammatory, Laxative, Phytochemical.

SUMMARY

- *Achyranthes aspera* leaf showed prominent anti-helmenthic activity.
- *Achyranthes aspera* leaf showed presence of phytochemical constituents.
- *Achyranthes aspera* is used in management of inflammatory disorders, cough, bronchial asthma.
- *Achyranthes aspera* leaf extract were reported to posses thyroid stimulating and antiperoxidative properties.
- *Achyranthes aspera* strengthen the liver and kidneys, strengthening muscles,

tendons and bones, anti-toxin, urine laxative, normalize menstruation, hemostatic, ease childbirth.



PICTORIAL ABSTRACT

Abbreviations used: *A. aspera*: *Achyranthes aspera*, DMSO: Dimethyl sulfoxide.

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INTRODUCTION

Achyranthes aspera L. (*Amaranthaceae*) is distributed as weed throughout India, tropical Asia and other parts of the world.¹⁻³ The plant is a popular folk remedy in traditional system of medicine throughout the tropical Asian and African countries. It grows throughout the tropical and warmer regions throughout the world.⁴⁻⁶ The weed is also found in many other countries of Asia as well as Africa, America, Europe and Australia.^{7,8} The plant is reported to be used as antimicrobial, larvicidal, antifertility, immunostimulant, hypoglycemic, hypolipidemic, anti-inflammatory, antioxidant, diuretic, cardiac stimulant, antihypertensive, anti-anasakra, analgesic, antipyretic, antinoiceptive, prothyroic, antispasmodic, antihelminthic, etc for various purpose.⁹

MATERIAL AND METHODS

Plant Material

Achyranthes aspera where collected from Hosur Tamil nadu. Leaves were dried in open air under shade. 100 g of dried *Achyranthes aspera* was used in extraction Method. Plant material was authenticated by NIS-CAIR, New Delhi. The voucher specimen were stored in M/s. Green Chem, Bangalore For further use.

Extraction protocol

The powdered dried leaf of *Achyranthes aspera* extracted with 80% Ethanol, at 55 to 60°C temperature, for 2 hours, in a round bottom flask with condenser attached. Collect the extract. Repeat extraction with 80% Ethanol. Collect the extract. Marc was again extracted with 50% ethanol twice at a temperature of about 55 to 60°C, for 2 hours. The extracts are distilled. Solvent was removed under pressure in a Buchi Rotary evaporator at 30-35°C to obtain a concentrate. The concentrate was chilled at temperature about 6–10°C for a period of about 7-8 hours to remove the resinous matter. Chilled concentrate was filtered. Filtrate was collected. Filtrate was evaporated to dryness under reduced pressure in a Buchi Rotary Evaporator (Switzerland) at 50-55°C. Powdered *A. aspera* leaf extract was obtained.

Drugs and chemicals

All the chemicals and reagents were procured from HI media (Mumbai, India). All the chemicals were of analytical grade. The drug Albendazole was procured from Sigma aldrich.

Phytochemical analysis

The ethanolic extract so obtained from the dried leaf powder of *A. aspera*, were tested for the presence and absence of the phytochemicals

-Tannins, Phlobatannins, Saponins, Flavonoids, Terpenoids, Phenols, Cardiac glycosides and Steroids according to method described by Evans.¹⁰ The results are depicted in Table 1.

Table 1: Phytochemical analysis of *Achyranthes aspera* leaf

Phytochemical	<i>Achyranthes aspera</i>
Flavonoids	-
Tannins	+
Saponins	+
Terpenoids	-
Cardiac glycosides	-
Steroids	-
Phlobatannins	-

+ = Presence; - = Absence.

Experimental model

Adult earthworms of the genus and species, *Phertima posthuma*, were collected (due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings) from moist soil and washed out of sand. Four groups of approximately equal size earthworms Consisting of six earthworms in each group were used for the present study.¹¹

Anthelmintic Evaluation

Standard Drug

Albendazole is taken as standard drug and the concentration of the standard drug was prepared in dissolving DMSO to give 80 mg/ml, 60 mg/ml, 40 mg/ml and 20 mg/ml concentration.

Antihelmenthic assay

Four groups of approximately equal size earthworms consisting of six earthworms in each group were used for the present study, Albendazole, Ethanolic extract (20 mg/ml, 40 mg/ml, 60 mg/ml and 80 mg/ml concentration). Observations were made for the time taken to paralysis and death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body color.¹²⁻¹⁶

RESULT AND DISCUSSION

Helminths are parasitic worms. They are the most common infectious agents of humans in developing countries and produce a global burden of disease including malaria and tuberculosis.¹⁷ These same helminthiasis markedly altered the course of modern twentieth century world history. Today, it is estimated that approximately one-third of the almost three billion people that live on less than two US dollars per day in developing regions of sub-Saharan Africa, Asia, and the Americas are infected with one or more helminth.¹⁸

The most common helminthiasis are those caused by infection with intestinal helminths, ascariasis, trichuriasis, and hookworm, followed by schistosomiasis. The treatment given to treat helminthiasis such as Albendazole was well tolerated and did not produce any significant side-effects. Single dose albendazole appears to be appropriate for mass chemotherapy to control intestinal nematode infections in highly infected communities.¹⁹ Herbal drugs are commonly used in eradication of various infections. It is popularly used in traditional system of medicine. Lots of herbal drugs have the potency to inhibit the adult earthworms, roundworms and hookworms for worm infestations, herbal drugs have been observed as an effective remedy.

Achyranthes aspera stem extract has been proved to possess the anti-helmenthic activity, Hence *A.aspera* leaf extract were tested at various concentration against adult earthworm.

The ethanolic leaf extract of *Achyranthes aspera* showed significant anthelmintic activity. The result of anthelmintic activity of alcoholic leaf extract of *A. aspera* on earthworms (*Phertima posthuma*) were given in Table 2. It was concluded from the study that the extract showed marked anthelmintic activity than the standard drug albendazole. Standard drug albendazole is showing moderate activity.

Table 2: Anti helminthic assay of *Achyranthes aspera* leaf against *Phertima posthuma*

Drug	Concentration Mg/ml	Paralysis time in (min.)	Death time in (min.)
Ethanolic extract of <i>A. aspera</i>	20	68.60 + 0.26	84.2 + 0.3
	40	52.32 + 1.08	68.0 + 0.86
	60	48.30 + 0.68	60.13 + 0.76
	80	42.18 + 0.26	38.46 + 0.23
Albendazole	20	11.00 + 4.50	22.00 + 9.00
	40	11.60 + 4.75	45.00 + 17.00
	60	14.10 + 5.77	47.16 + 19.23
	80	14.30 + 5.86	49.16 + 20.00

CONCLUSION

In conclusion, the traditional use of leaf of *Achyranthes aspera* as an anthelmintic drug have been confirmed as the ethanolic extract of *A. aspera* displayed activity against the worms used in the study. Further studies are required to establish the mechanism(s) of action are required.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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