

-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.

REFERENCES

- Shibeshi W, Makonnen E, Zerihun L, Debella A. Effect of *Achyranthes aspera* L. on fetal abortion, uterine and pituitary weights, serum lipids and hormones. African Health Sciences 2006; 6(2): 108-12.
- Joshi AC. Dedoublement of stamens in *Achyranthes aspera* Linn. J. Indian bot. Soc. 1932; 11(4): 335-9.
- Kajale LB. Embryology of *Achyranthes aspera* Linn. Proceedings: Plant Sciences 1937; 5(5): 195-205.
- Girach RD, Khan ASA. Ethnomedicinal uses of *Achyranthes aspera* leaves in Orissa (India). Int J Pharmacogn. 1992; 30(2): 113-5.
- Liersch Bkher. *Achyranthes*. In: Haensel R, Keller K, Rimpler G, Schneider G (eds) Hagers Handbuch der Pharmazeutischen Praxis V. Springer-Verlag, Berlin; 1992. 54-9.
- Hooker JD. The Flora of British India. 4, L. Reeve & Co. Ltd, Kent; 1885. 713-30.
- Prain D. Bengal Plants. 4, Botanical Survey of India. Calcutta; 1963. 646-55.
- De Lange PJ, Scofield RP, Greene T. *Achyranthes aspera* (Amaranthaceae), a new indigenous addition to the flora of the Kermadec Islands group. New Zealand J. Bot. 2004; 42(2): 167-73.
- Shafique S, Javaid A, Bajwa R, Shafiqe S. Biological control of *Achyranthes aspera* and *Xanthium strumarium* in Pakistan. Pak. J. Bot. 2007; 39(7): 2607-10.
- Evans WC. Trease and Evans Pharmacognosy 14 Edn. WB Saunders Company. London; 1996.
- Blakemore R. Diversity of exotic earthworms in Australia-status report. Transac-

- tions of the Royal Zoological Society of New South Wales 1999; 99: 182-7.
12. Dwivedi SN. Herbal remedies among the tribals of Sidhi District of Madhya Pradesh. *J. Econ. Tax. Bot.* 2004; 20(3): 675-87.
 13. Gunasekhararan R, Divyakant A, Senthilkumar KL. Anthelmintic activity of bark of *Neolamarckia cadamba* Roxb. *Ind. J. Nat. Prod.* 2006; 22(1): 11-3.
 14. Kosalge SB, Fursule RA. Investigation of *in vitro* Anthelmintic Activity of *Thespesia Lampas* (cav.). *Asian J. Pharm. Clin. Res.* 2009; 2(2): 69-71.
 15. Khadatkar SN, Manwar JV, Bhajipale NS. *In vitro* Anthelmintic Activity of Root of *Clitoria Ternatea* Linn. *Phcog. Mag.* 2008; 4(13 Suppl): 148-50.
 16. Mali RG, Wadekar RR. *In Vitro* Anthelmintic Activity of *Baliospermum Montanum* Muell. *Arg Roots Indian J. Pharm. Sci.* 2008; 70(1): 131-3.
 17. Faust EC, Russell PF, Jung RC. *Craig and Faust's clinical parasitology*. 8th edition. Philadelphia, Lea & Febiger; 1970. p. 251.
 18. Cox FEG. *History of human parasitology*. *Clin. Microbiol. Rev.* 2002; 15(4): 595-612.
 19. Hotez PJ, Ottesen E, Fenwick A, Molyneux D. The neglected tropical diseases: the ancient afflictions of stigma and poverty and the prospects for their control and elimination. *Adv. Exp. Med. Biol.* 2006; 582: 23-33.

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