



A Study of In Vitro Evaluation of Anti-Helminthic Activity of *Amaranthus viridis* Leaf Extract

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ABSTRACT:

The plant *Amaranthus Viridis* belongs to the Amaranthaceae family and is traditionally used as a vermicide. Our aim was to investigate the anthelmintic activity of *Amaranthus Viridis* using earthworms (*Pheretima Posthuma*). Ethanol extract at two concentrations of 10 mg/ml and 20 mg/ml, and ethyl acetate extract of two concentrations 10 mg/ml and 20 mg/ml, showed dose-dependent vermicide activity. At concentration 20 mg/ml of ethanol extract and ethyl acetate extract caused paralysis in 35 minutes and 50 minutes and death in 40 minutes and 55 minutes respectively. Ethanol extract showed more potent activity than the ethyl acetate extract. Albendazole was used as a reference standard at a concentrations 10 mg/ml and 20 mg/ml. our study found that the *Amaranthus Viridis* possess potent anthelmintic activity when compared to Albendazole.

keywords: *Amaranthus viridis* L., Anthelmintic activity, parasite infection, *Pheritima postuma*.

INTRODUCTION:

The World Health Organization estimates that a staggering two billion people harbor parasitic worm infections. Parasitic worms also infect livestock and crops, affecting food production with a resultant economic impact. Despite this prevalence of parasitic infections, the research on the anthelmintic drug is sparse. According to the WHO, only a few drugs are used in treatment of helminthes in humans.

Anthelmintics from natural sources could play a key role in the treatment of these parasite infections. In view of this, attempts have been made to study the anthelmintic activity of traditional medicinal plants.

Amaranthus viridis L. (Amaranthaceae) is commonly called “Chilaka Thota-Kura” in Telugu. In Nepal, an infusion of powdered seeds of *A. viridis* is used for stomach problems and in pregnant women to alleviate labor pains (Mark, 2003). The Negritos of the Philippines apply the bruised leaves directly to eczema, psoriasis and rashes (Eduardo and Quisumbing, 1951). Other traditional uses are based on their apparent antipyretic, diuretic, antirheumatic, antiulcer, analgesic, antiemetic, laxative, appetite stimulatory, antileprotic properties and for treating respiratory problems, eye ailments and asthma (Kirithikar and Basu, 1986; Hassan Sher and Khan, 2006; Quershi et al., 2008; Muhammad Ejaz Ul Islam Dar, 2003; Muhammad, 2000; Muhammad and Amusa, 2005).



Fig. No. 01: *Amaranthus viridis* plant.

INTRODUCTION TO EARTHWORMS

Scientific classification:

Kingdom	: Animalia
Class	: Oligochaeta
Subclass	: Oligochaeta
Families	: Acanthodrilidae, Almididae

An earthworm has a double transport system composed of coelomic fluid that moves within the fluid-filled coelom and a simple, closed blood circulatory system it has a central and a peripheral nervous system. Large numbers of chemoreceptors are concentrated near its mouth. Circumferential and longitudinal muscles on the periphery of each segment enable the worm to move. theoretical studies have placed them, instead, in the suborder lumbricina of the order haplotaxida, but these may again soon change folk names for the earthworm including “dew-worm”, “rain-worm”, night crawler”, and “angle-worm”.

BODY: Depending on the species, an adult earthworm can be from 10 mm (0.39) in long and 1 mm (0.39) in wide to 3 m (9.8 ft) long and over 25 mm (0.98) in wide, but the typical Lumbricus Citation: G. Nagaraju et al. Ijppr.Human, 2022; Vol. 24 (3): 1-2. 457 www.ijppr.humanjournals.com terrestris grows to about 360 mm (14) in long Special ventral setae are used to anchor mating earthworms by their penetration into the bodies of their mates.



Fig. No. 02: Earthworm

CROSS-SECTION OF EARTHWORM: The cross-section of the body of an earthworm (oligochaeta) shows the disposition of the more important organs the body wall consists of dermis, circular and longitudinal muscles the body cavity is divided by membranes into a series of chambers, in each of which opens the mouth of a coiled nephridium the axis of the cavity is occupied by the intestine above and below it is a longer blood vessel and below it is also the central nerve cord.

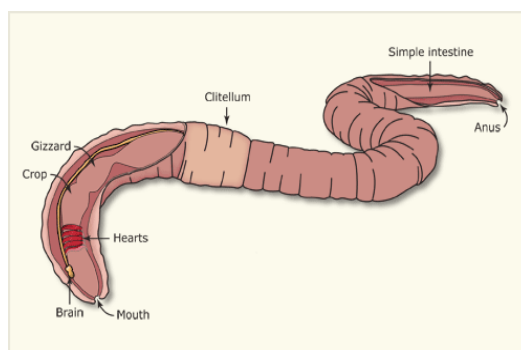


Fig. No. 03: Parts of Earthworm

HELMINTHIASIS:

Helminthiasis is any macroparasitic disease in humans or animals caused by parasitic worms (helminths) such as roundworms,

tapeworms, and flukes. Infections primarily spread through the fecal-oral route, contaminated food/water, or skin penetration. It is highly prevalent in areas with poor sanitation and is treated with anthelmintic medications.



Fig. No. 04: Helminthiasis of Earthworms

Treatment: Albendazole in the treatment of intestinal helminthiasis in children.

A single dose of 2% Albendazole suspension (400 mg in 20 ml) was administered to 77 patients (42 males and 35 females), ages ranging between 2 to 12 years, with helminthic infections (12). Ascariasis was the most prevalent infection. Patients were followed up for 3 weeks the results showed that albendazole was highly effective against *Ascaris lumbricoides*, *Ancylostoma duodenal* and *enterobius vermicularis*. Significant improvement was also observed in patients having infections due to *Trichuris trichiura*. 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.

MATERIALS AND METHODS:

➤ **Collection of *Amaranthus viridis* leaves:**

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

➤ **Plant authentication:**

The plant was taxonomically identified and authenticated as *Amaranthus viridis* by Dr.A.H. Naqvi, Department of Botany, SRR Govt. Degree college, Karimnagar, Telangana.

➤ **Various extractions of drug:**

The dried powdered leaf material of *Amaranthus viridis* was extracted with Ethanol and Ethyl acetate using Soxhlet apparatus. After exhaustive extraction the collected Ethanol and Ethyl acetate extracts were subjected to evaporation to obtain the pure extract.

➤ **Soxhlet Extraction:**

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 gets back 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 get 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 ethanol extract contains Tannins, Saponins, Flavonoids, Alkaloids, Steroids, phenolic compounds, glycosides, coumarins, organic acids, Terpenoids, Proteins and aminoacids.
- The ethyl acetate extract contains Alkaloids, Glycosides, Saponins, Tannins, Coumarins.



INVITRO ANTHELMINTIC ACTIVITY:

The anthelmintic activity was evaluated on adult Indian earthworms by Mathew et.al method. 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 petridish 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.

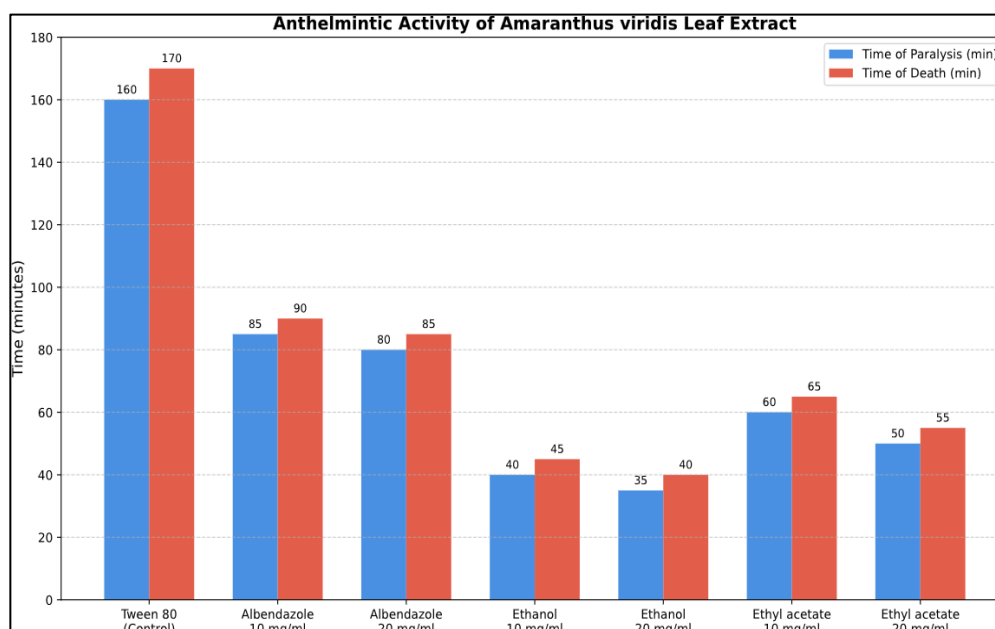
RESULTS

In vitro anthelmintic activity of ethanol and ethyl acetate extracts of *amaranthus viridis* at different concentrations was performed and the results are shown in Table.

Table No. 1: Anthelmintic activity of *Amaranthus viridis* plant leaf extract.

Plant extract	Concentrations(mg/ml)	Time of paralysis in minutes	Time of death in minutes
Tween80 (negative control)	1%	160	170
Albendazole (standard)	10	85	90
	20	80	85
Ethanol	10	40	45
	20	35	40
Ethyl acetate	10	60	65
	20	50	55

Bar graph of Anthelmintic activity of *Amaranthus viridis* leaf extract



DISCUSSION

In the present study it was observed that all the extracts have possess response to certain degree of anti-helminthic activity. The activity is well comparable with the standard drug albendazole as positive control. Tween80 (1%) was used as negative control. The ethanol extract had shown potent activity compared to other extract and standard drug where it took 35 minutes for paralysis and 40 minutes for death for 20mg/ml concentration. Ethyl acetate extract also exhibited good activity by paralyzing the worm 50 minutes



and killing by 55 minutes for 20mg/ml. phytochemical screening revealed the presence of alkaloids, tannins, phenols which may responsible for anti-helmintic activity.

CONCLUSION

It is revealed that the ethanol and ethyl acetate extracts obtained from the leaves of *Amaranthus viridis* possess anti-helmintic activity, but the ethanol extract showed enhanced anti-helmintic activity when compared with ethyl acetate extract and standard drug albendazole. In order to confirm the above results, the *in vivo* studies have to be conducted.

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Conflict of Interest Statement: All authors have nothing else to disclose.

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