

# Anthelmintic activity of *Hydroalcoholic Extract* of seeds of *Tribulus terrestris* L on *Phertima posthuma*

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## Abstract

Helminthic infections are the most common gastrointestinal infection in human beings and animals affecting large proportions of population in the world. Parasitic worms such as Schistosomes can reside in the blood vessels also. Anthelmintics or Antihelmintics are a group of antiparasitic drugs that expel or kills intestinal worms without causing significant damage to the host cells. They may also be called as vermifuges or vermicides. In this study the hydroalcoholic extract of seeds of *Tribulus terrestris* is investigated for anthelmintic activity on adult Indian earth worm *Phertima posthuma*, using Piperazine citrate as standard reference and double distilled water as control. The time taken for paralysis and death of worm were determined, tabulated and compared. Considering the obtained results of hydroalcoholic extract of *Tribulus terrestris*, it showed comparable activity.

*Key words : Anthelmintics , Piperazine citrate , tribulus terrestris*

## Introduction

Intestinal worms, are also known as parasitic worms. The common types of intestinal worms include flat worms (trematodes), round worms (nematodes), tape worms (cestodes) pinworm, hook worm etc. This infestations causes abdominal pain, diarrhoea, nausea, vomiting, gas/bloating, fatigue, weight loss etc. They may cause anemia and intestinal blockages. Complication may be seen in people who have suppressed immune conditions such as HIV or AIDS infection. The common reasons for intestinal worm infestation being consumption of contaminated water, food materials, contact with contaminated faeces, poor sanitation, and poor hygiene. Serious symptoms being presence of blood or pus in stool, vomiting daily or frequently, elevated body temperature, condition of fatigue and dehydration.

Tapeworm are usually treated with praziquantel. Round worm are treated with albendazole. *Strongyloides stercoralis* is a round worm which causes a life threatening disease called strongyloidiasis. People can become infected through contact with soil

contaminated by faeces containing the parasite traces. Some parasites are spread by insects that act as a vector.

The Chemotherapeutic drugs available in the market being, Albendazole , Mebendazole , Piperazine citrate , Diethylcarbamazine , Ivermectin, Thiabendazole , Levamisole , Praziquantel , Oxamniquine , Bithionol , Niclosamide etc. In this study the Hydroalcoholic extract of seeds of Tribulus terrestris is investigated for anthelmintic activity on adult Indian earth worm *Phertima posthuma* ,using Piperazine citrate as standard reference and double distilled water as control.

**Mechanism of action** of piperazine citrate is being, it blocks the response of the worm muscle to acetylcholine ,thus paralyzes the parasite,which allows the host body to easily expel it in faeces. The time taken for paralysis and death of worm were determined ,tabulated and compared . This study will support and stabilize a better way to avoid folkway belief over this tribulus terrestris

### AIM and OBJECTIVES

This study aim is to find out the Anthelmintic activity of Hydroalcoholic extract of seeds of Tribulus terrestris on *Phertima posthuma* (Indian Earth worm)

The whole plant of tribulus terrestris is used as decoction and powder form to treat calculi ,Intrinsic heamorrhage ,dysuria , to promote hair growth , arthritis rejuvenative and as an Aphrodisiac. In this present study, the hydroalcoholic extract of tribulus terrestris is used in two doses of 10mg/ml and 20mg/ml to the Indian earth worm of 10 cm length each and the time taken for paralysis and the time taken for death of the organism is determined. This earth worm anatomically and physiologically resembles the intestinal round worm of human beings. The time value obtained in minutes for the extract is compared with a standard drug piperazine citrate and analysed

### Plant Description (seed)

Botanical Name : Tribulus terrestris L

Kingdom : Plantae

Order : Zygophyllales

Family : Zygophyllaceae

Genus : Tribulus

Species : T. terrestris

Tamil : Nerunjil mull, Cinerunjil

Hindi : Gokshur

English : Caltrops, devils thorn

Malayalam : Neringil , Nerinnil

Telegu : Chirupallerumullu

Common Names : Puncture Vine , Goat Head



## Materials and methods

### Seed Collection

The matured well grown seeds of *Tribulus terrestris* were collected from in and around Nagercoil during the month of December 2020. This sample is authenticated by **Dr.M.SyedAli Fathima Ph.D**, Assistant professor , Department of Botany , Sadakathullah Appa college , Tirunelveli-627011. A voucher specimen of *Tribulus terrestris* was deposited in the Department of Pharmaceutical Chemistry , of S.A.Raja Pharmacy College , Vadakangulam , Tirunelveli District-627116, for future reference.The seeds were dried in shade away from sunlight ,Pulverised in a mechanical mill to get a coarse powder of sieve size 40 mesh and used for the Extraction of the active constituents.

### Extraction

About 1 kg of the coarse powder was extracted using aqueous methanol by hot percolation process for 72 hours until complete extraction was effected .The filtrate is collected and it is concentrated in a rotary Evaporator to get a solid residue.This extract is dried and preserved in a desicator.The ultimate yield of the dried extract being 7.1 gms.

### Phytoconstituents Evaluation

The extract obtained on extraction using aqueous methanol were used for the phytoconstituents evaluation

**Table - 1**

S.No	Phytoconstituents	Presence(+)/absence(-)
1	Steroids	+
2	Saponins	+
3	Flavanoids	+
4	Alkaloids	+
5	Sterols(Steroids with 3-OH)	+
6	Carbohydrates	+
7	Proteins	+
8	Coumarins	-
9	Tannins	+

### Pharmacological Activity

#### Anthelmintic Activity

On the day of experiment mature Indian earth worm of length  $9 \pm 1$  cm is collected in a petri dish. They were washed with normal saline to remove all exogenous waste matter. They were divided into four groups, each having six earth worms. Each group were treated with solvent and other ingredients as follows

**Table - 2**

S.No	Group	Solvent composition
1	Reference (Six earth worm)	10 ml of 1% gum acacia in double distilled water
2	Standard (Six earth worm)	10 ml of 1% gum acacia in double distilled water +10mg piperazine citrate
3	Dose 1 (Six earth worm)	10 ml of 1% gum acacia in double distilled water +10 mg of the Extract of Tribulus Terrestris
4	Dose 2 (Six earth worm)	10 ml of 1% gum acacia in double distilled water+20 mg of the Extract of TribulusTerrestris

This procedure is repeated thrice with another two sets of same earth worm to obtain an average statistical data.

**Table - 3**

**ANTHELMINTIC ACTIVITY OF HYDROALCOHOLIC  
EXTRACT OF SEEDS OF TRIBULUS TERRESTRIS**

GROUPS	Concentrations (Mg/ml)	Plant name	
		Time taken for Paralysis in min	Time taken for Death in min
Distilled water	-	-	-
Piperazine citrate	10	24.4±1.1	47.5±1.7
Hydroalcoholic extract of TT	10	36.7±1.6**	62.2±0.3**
	20	25.1±0.7***	42.7±1.4****

All experiments were repeated thrice. The mean and SEM were analyzed statistically by ANOVA followed by Dunnett's test,  $P < 0.05$  being considered as significant.

The crude hydroalcoholic extract of *Tribulus terrestris* (10 and 20 mg/ml in double distilled water) and mixed with 1% gum Acacia in double distilled water, were prepared and six earthworms (same size) were placed in it. Both the test solution and standard drug solution were freshly prepared and 'time taken for paralysis' was noted when no movement of any sort could be observed except when the worms were vigorously shaken. The 'time for death' of the worms was recorded after confirming that the worms neither moved when shaken vigorously nor when dipped in warm water at 50°. A maximum time period of 120 min was ascertained for the paralyzing as well as death time of worms. Piperazine citrate (10 mg/ml) was used as reference standard with distilled water as the vehicle control. Death was further confirmed with fading away of the body colour to grayish colour. Further studies of phytoconstituents shows the presence of flavanoids, steroids and saponins are responsible for the Anthelmintic activity.

**Conclusion**

Evaluation of anthelmintic activity was compared with reference standard piperazine citrate. The higher concentration of hydroalcoholic extract of *Tribulus terrestris*, caused paralysis at 25.1 min. and time of death at 42.7 min whereas the lower concentration of

extracts of *Tribulus terrestris* showed paralysis at 36.7 min. and time of death at 62.2 min. The reference drug piperazine citrate showed the time of paralysis and time of death as 24.4 and 47.5 min, respectively. Considering the obtained results of hydroalcoholic extract of *Tribulus terrestris* showed comparable activity, and the traditional use of *tribulus terrestris* has been confirmed, and it would be important to identify the key phytoconstituents on isolation of the individual constituents using newer techniques.

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