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## Full Length Research Paper

# PHARMACOLOGICAL STUDYS FOR INVESTIGATION OF ANTIHELMINTIC ACTIVITY OF *CUCUMIS DIPSACEUS* AGAINST ADULT INDIAN EARTHWORM *PHERITIMA POSTHUMA*

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### Abstract

The present research program was carried out to investigate the antihelmintic activity of the aqueous and ethanolic extract of *Cucumis dipsaceus* against adult Indian earthworm *Pheritima posthuma*. Various concentrations (25, 50, 100mg/ml) of ethanolic extract evaluated for antihelmintic activity by recording the time required for paralysis and death of worms. Albendazole was used as standard. Result indicates ethanolic extracts of *Cucumis dipsaceus* significantly ( $p < 0.01$ ) exhibited antihelmintic activity in dose dependent manner when compared with standard. The shortest time required for paralysis and death was observed with concentration of 100mg/ml. Further studies are under progress to confirm the possible chemical constituents responsible for activity.

**Keywords:** *Cucumis dipsaceus*, Anti-helmentic, *Pheritima Posthuma*.

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## INTRODUCTION

*Cucumis dipsaceus* Ehrenb. Ex Spach is a species of flowering plant belonging to the family Cucurbitaceae. It has its origin in Ethiopia and is known by several common names like "teasel gourd, Arabian cucumber, hedgehog, pepino-diablito, concombres porc-epic etc (Verdcourt and Trump, 1969). The consumption of locally semi wild edible plants has been important for most human cultures as they often contain higher amount of nutrients and bioactive compounds (Trichopoulou et al., 2000). Usually these are consumed as leafy vegetable and has anti oxidant and used for nutritional purpose (Sarkiyayi and Agar, 2010). *Cucumis dipsaceus* is also used for hair growth (Bussmann and Glenn, 2010). It is also used in many disease conditions like congestive heart failure, hypertension, cerebrovascular accidents, and diabetic complications (Chen et al., 2002). Dietary antioxidants are carotenoids and phenolic compounds (Shahidi, 2007). Degradation of biomolecules mostly lipids, carbohydrates and proteins may occur due to oxidation reactions. Synthetic antioxidants are restricted due to their carcinogenic effect (Madhavi et al., 1996; Madhavi et al., 1996). *Cucumis dipsaceus* is the natural antioxidant with more therapeutic efficiency and less toxic effects. Helminthes, also commonly known as parasitic worms are large multicellular organisms, which when mature can generally be seen with the naked eye.

They are often referred to as intestinal worms even though not all helminths reside in the intestines; for example Schistosomes are not intestinal worms, but rather reside in blood vessels. Soil-transmitted helminthiasis (SHT) and schistosomiasis are the most important group of helminthiases, collectively belonging to the "neglected tropical diseases" (Jump, 2015). Soil-transmitted helminthiasis is responsible for parasitic infections in a quarter of the total human population (Jump, 2014). Anthelmintics or antihelminthics are drugs that expel parasitic worms (helminths) and other internal parasites from the body by either stunning or killing them and without causing significant damage to the host. They may also be called vermifuges (those that stun) or vermicides (those that kill). They are used to treat people or animals that are infected by helminths - a condition called *helminthiasis* (Department of the Army Headquarters, 2004). Ascariasis may exist as a zoonotic infection correlated with pigs and use of hog manure (Notes from the field, 2013)]. Treatment with an antihelminthic drug kills worms whose phenotype renders them susceptible to the drug. But resistant parasites survive and pass on their "resistance" genes. Resistant varieties accumulate and finally treatment failure occurs (Department of the Army Headquarters, 2004). "London Declaration on Neglected Tropical Diseases" which was launched on 30 January 2012. It aims to control or eradicate those particular diseases by 2020, by ensuring necessary supply of drugs and other intervention, and promoting sanitation and health education" (Jump, 2011).

Hence this first attempt is made to evaluate the anthelmintic activity from the leaves of *Cucumis dipsaceus* ehrenb.

## MATERIALS AND METHODS

### Collection and authentication

*Cucumis dipsaceus* ehrenb leaves were collected from Narsapur, Medak district and authenticated by D.Venkateshwara Rao, Deputy Director, A.P. Forest Academy, Dullapally, Hyderabad, Ranga Reddy Dist.

### Preparation of plant material

The plant leaves was washed under running tap water to make it free from dust and foreign particles.

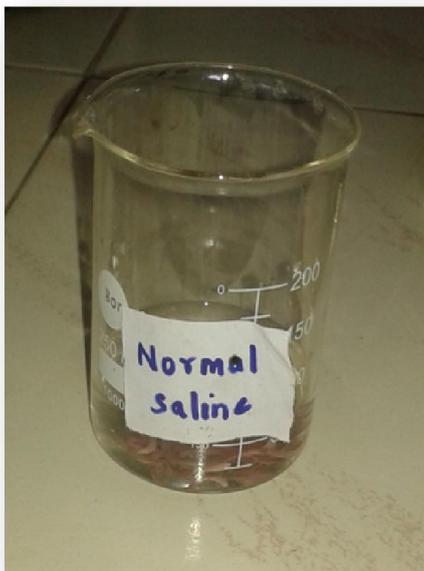
The plant leaves were powdered and kept in air tight container before analysis.

### Preparation of ethanolic extract

10 gm of powder was soaked in a 60 ml of ethanol, heated at 20-30°C for 20 minutes and filtered using (Whatman filter paper No.1) filter paper. The filtrate was centrifuged at 2000 rpm for 20 minutes and analyzed by anthelmintic activity.

### Selection of worms

Adult Indian earthworms, *Pheretima posthuma* having anatomical and physiological resemblance with intestinal roundworm parasite of the human being. So *Pheretima posthuma* were used for present study (Chatterjee, 1967).



Normal saline



25% concentration of Albendazole



50% concentration of Albendazole

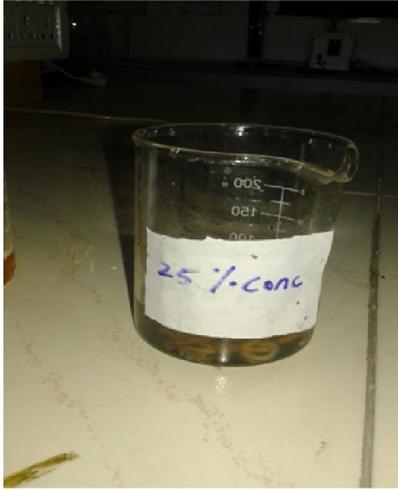


100% concentration of Albendazole

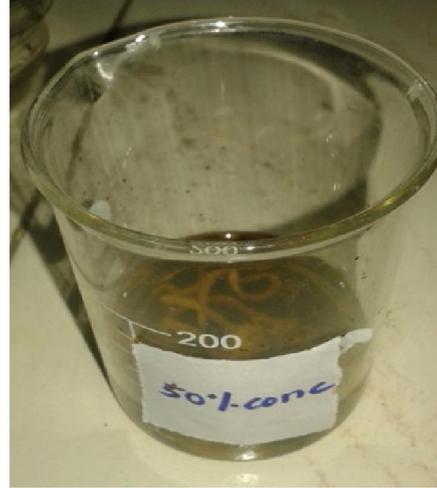
### Evaluation of Antihelminthic Activity

The antihelminthic activity was evaluated on adult Indian earth worm, *pheritima posthuma*. Standard concentrations of Albendazole (25, 50,100) were prepared by dissolving in normal saline.

The paralytic time and death time were noted. Death time was noted only when worms lost their motility. The readings was compared with the standard drug Albendazole at concentrations of 25, 50, 100 and showed closest result with that of standard drug albendazole.



25% concentration of *Cucumis dipsaceus*



50% concentration of *Cucumis dipsaceus*



100% concentration of *Cucumis dipsaceus*

Table 1.

GROUPS	Treatment	Concentration (mg/ml)	Paralysis time (min)	Death time (min)
Group I	Vehicle (normal saline)	---	---	---
Group II	Ethanolic extract	25	50.14±1.36	71.21±1.32
Group III	( <i>Cucumis dipsaceus</i> )	50	34.25±1.40	66.43±0.35
Group IV		100	18.22±1.46	61.15±0.89
Group V	Albendazole	25	34.33±0.84	60.83±1.15
Group VI		50	25.10±1.65	49.45±1.72
Group VII		100	14.32±0.57	26.31±0.81

The ethanolic leaf extract of *cucumis dipsaceus* ehrenb was dissolved in normal saline at the concentrations of 25mg/ml, 50mg/ml, 100mg/ml. 50ml of saline was taken as control. 5 earthworms were placed in each beaker containing concentrations of standard, leaf extract and control respectively.

### RESULTS AND DISCUSSION

Experimental data showed that, the ethanolic extract of *Cucumis dipsaceus* has antihelminthic activity in dose dependent manner as shown in Table 1.

The shortest time required for paralysis and death was observed with concentration of 100mg/ml. higher concentration of ethanolic extract showed maximum effect when compared with lower concentration.

### Conclusion

Anthelmintics are drugs that expel parasitic worms (helminths) from the body, by either stunning or killing them (Dwivedi *et al.*, 2000). Moreover, these drugs are unaffordable because of their high cost. These factors saved the way for herbal remedies as alternative anthelmintics. In present study of leaf extract of *Cucumis dipsaceus* was selected and studies for its anthelmintic activity and the experimental results concluded that *Cucumis dipsaceus* leaves showed significant anthelmintic activity.

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