



## Investigation of *In-Vitro* Anthelmintic Activity of *Tridax Procumbens* Stems

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### ABSTRACT

The crude extract of *Tridax procumbens* stems in water, methanol, ethanol, ethyl acetate, chloroform, were evaluated on adult Indian earthworms *Pheretima posthuma* for anthelmintic activity. The stems extract of *Tridax procumbens* exhibited a dose dependent inhibition of spontaneous motility (paralysis) and evoked responses to pin-prick. The effects were comparable with that of albendazole. The result showed that the ethanol extract of *Tridax procumbens* and found to be statistically significant at the ethanolic extract possessed wormicidal activity and thus, may be useful as an anthelmintic.

**Keywords:** *Tridax procumbens*, anthelmintic activity, wormicidal activity.

### INTRODUCTION

Helminths parasite infections are global problems with serious social and economic repercussions in the Third World countries. The diseases affect the health status of a large fraction of the human population as well as animals. Some type of dangerous helminths infections like filariasis has only a few therapeutic modalities at present. The continuous and long-term reliance on a small range of compounds has led to the development of drug resistance in many helminthic strains.<sup>1</sup> In addition, after treatment with albendazole or mebendazole, several side effects have been reported in hosts such as gastrointestinal symptoms, nervous system symptoms and allergic phenomena. Some anthelmintic drugs, such as praziquantel and albendazole, are contraindicated for certain groups of patients like pregnant and lactating woman. These drugs have also to be used with caution in hepatitis patients and in children below 2 years of age.<sup>2</sup> Keeping this in view, the present communication deals with the evaluation of the anthelmintic activity of roots of *Tridax procumbens*.

*Tridax procumbens* Linn. Belongs to the family Compositae. It is a weed found throughout India. A hispid, procumbent herb with woody base sometime rooting at the node, upto 60 cm high. Leaves are ovate-lanceolate 2 to 7 cm and lamina pinnatisect, sometimes three lobed; flowers in small, long peduncled heads; achenes 1.5 - 2.5 mm long x 0.5 – 1 mm in diameter and densely ascending pubescent; persistent; bristles of disc achenes alternately longer and shorter, 3.5 – 6 mm in length.<sup>3</sup>

The plant is reported for its pharmacological actions like is commonly used in Indian traditional medicine as anticoagulant, antifungal and insect repellent, in bronchial catarrh, diarrhoea and dysentery.<sup>4,5</sup> Moreover it possesses wound healing activity and promotes hair growth.<sup>6</sup> The leaves are reported to be employed in bronchial catarrh, dysentery or diarrhoea and for restoring hair. The leaf gel possesses antiseptic,

insecticidal and parasiticidal properties. It is used to check haemorrhage from the cuts, bruises and wounds. An aqueous extract of plant produces reflex tachycardia and showed a transient hypotensive effect on the normal blood pressure. It is employed as an indigenous medicine for a variety of ailments including jaundice. The plant also has hepatoprotective activity and it is used in Ayurveda in various liver disorders.<sup>7</sup>

Literature survey reveals that till date no reports were found on the anthelmintic activity of the stems extracts of *Tridax procumbens*.

### MATERIALS AND METHODS

#### Plant Material

The plant was collected from near region of Jamner in the month of February and authenticated by botanist Ujjawala Gaba Gavit, ASC college, Jamner, Jalgaon. After authentication, fresh stems material was collected in bulk, washed, shade dried and pulverized in mechanical grinder to obtain coarse powder.

#### Extraction Methodology

The root coarse powdered material (each 100 gm) was soaked in ethanol, ethyl acetate, chloroform, water (i.e. Maceration technique) for continuous 72 hours and then filtered off. Following extraction, the liquids were concentrated to remove traces of solvents and the process was repeated for two times. The solvent from total extract was distilled off and concentrate was evaporated on water bath to syrupy consistency and then evaporated to dryness. So our specimen was prepared.<sup>7</sup>

#### Worms Collection

Indian earthworm *Pheretima posthuma* (Annelida)<sup>8</sup> were used to study anthelmintic activity. The earthworms were collected from the moist soil from the near region of Jamner, Jalgaon, and washed with water. The earthworms in 3-5 cm in length and 0.1-0.1-2 cm in width were used for all experimental protocol. The earthworm



resembles both anatomically and physiologically to the intestinal roundworms parasites of human beings, hence can be used to study anthelmintic activity.

### Anthelmintic Activity

For the anthelmintic activity of *Tridax procumbens* stems, Indian adult earthworms (*Pheretima posthuma*) in 3-5 cm in length and 0.1-0.1-2 cm in width were used. The earthworms were divided in thirteen groups of six earthworms in each group. The ethanol, ethyl acetate, chloroform, aqueous extracts (50,100,200 mg/ml, each) extract was dissolved in normal saline and final volume

was adjusted to 10 ml; the extract and standard drugs were freshly prepared before starting the experiments. The extract of different concentration and standard solution were poured in different Petri dishes. All the earthworms were washed into normal saline solution before they are released in to Petri dishes. Observation were made for time taken to paralyze (paralysis was said to occur when earthworms didn't revive in normal saline) and death (death was concluded when earthworms lost their motility and followed with their body colours fading away). All the results were expressed as a mean  $\pm$  SEM of six earthworms in each group.

**Table 1:** Comparison of various extracts of *Tridax procumbens* stems

S. No.	TREATMENT	Time taken by Earthworms for	
		Paralysis (min)	Death (min)
A	Vehicle (control) ALBENDAZOLE 100 mg/ml	2.0466 $\pm$ 0.4990	2.785 $\pm$ 0.4725
B-1	WATER extract		
B-2	50 mg/ml	12.621 $\pm$ 0.5429	14.871 $\pm$ 0.4394
B-3	100 mg/ml	10.265 $\pm$ 0.4722	13.883 $\pm$ 0.4837
B-4	200 mg/ml	08.473 $\pm$ 0.6504	10.881 $\pm$ 0.8384
C	ETHANOLIC extract		
C-1	50 mg/ml	11.858 $\pm$ 0.7525	13.656 $\pm$ 0.9907
C-2	100 mg/ml	09.686 $\pm$ 0.6690	12.367 $\pm$ 0.5117
C-3	200 mg/ml	07.068 $\pm$ 0.6929	11.942 $\pm$ 0.9969
D	CHLOROFORM extract		
D-1	50 mg/ml	09.970 $\pm$ 0.6797	12.751 $\pm$ 0.5609
D-2	100 mg/ml	07.400 $\pm$ 0.5709	11.746 $\pm$ 0.6115
D-3	200 mg/ml	06.965 $\pm$ 0.4503	10.138 $\pm$ 0.6709
E	PETROLEUM ETHER extract		
E-1	50 mg/ml	05.970 $\pm$ 0.6797	07.751 $\pm$ 0.5609
E-2	100 mg/ml	03.400 $\pm$ 0.5709	05.746 $\pm$ 0.6115
E-3	200 mg/ml	02.965 $\pm$ 0.4503	04.138 $\pm$ 0.6709



**Figure 1:** *Tridax procumbens*

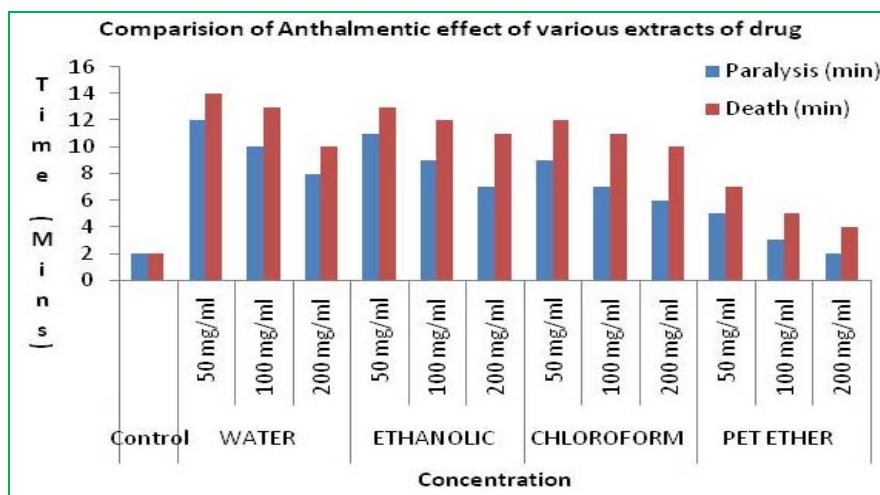


Figure 2: Comparison of Different extracts of *Tridax procumbens* stems

## RESULTS AND DISCUSSION

The preliminary phytochemical investigation of all the extracts of *Tridax procumbens* shows presence of steroids, tannins, alkaloids, flavonoids, carbohydrates, alkaloids, glycosides. Some of these phytoconstituents may be responsible to show a potent anthelmintic activity.

The perusal of the data reveals that as the concentration increases paralysis and death time decreases. Table 1 and figure 2 shows ethanolic extract at the concentration of 100 mg/ml showed both paralysis and death in 4.14 min and 7.17 min respectively. This possesses dose dependent and significant anthelmintic activity as compared with standard drug albendazole on earthworms. Among all the extracts ethanolic extract required least time to cause paralysis and death of the earthworms followed by ethyl acetate, chloroform and water extracts.

## CONCLUSION

From the above results, it is concluded that the ethanolic extract of *Tridax procumbens* Linn., shows potent anthelmintic activity to standard anthelmintic drug. Further studies using *in vivo* models are required to carry out and establish the effectiveness and pharmacological rationale for the use of *Tridax procumbens* Linn. As an anthelmintic drug. The drug can be further explored for the isolation and characterisation of the active constituents responsible for anthelmintic activity.

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