



# Evaluation of Anthelmintic potential of Ethanolic extract of *Desmodium gangeticum* leaves

Moses Samuel Rajan<sup>1</sup>, Sajo John\*<sup>1</sup>, Prima Freeda D'souza<sup>1</sup>, Sunil Koshy<sup>1</sup>, Prinkesh Fanasia<sup>1</sup> and V. A. J. Huxley<sup>2</sup>

<sup>1</sup>Department Of Pharmacology, Srinivas College Of Pharmacy, Valachil-Mangalore, Karnataka, India

<sup>2</sup>Biotech Research laboratory, Department of Zoology, Thiru. Vi. Ka. Govt. Arts College, Tiruvaraur - 610 003, Tamilnadu, India

## Abstract

Development of anthelmintic resistance and high cost of conventional anthelmintic drugs led to the evaluation of medicinal plants as an alternative source of anthelmintics. In the current study, experiments were conducted to evaluate the anthelmintic effects of ethanolic extracts of *Desmodium gangeticum* leaves at the concentration of 25, 50, 100 mg/ml. Results were expressed in terms of time for paralysis and time for death of worms. Piperazine citrate was used as a reference standard. Dose dependent activity was observed.

**Key words:** *Desmodium gangeticum*, *Pheretima posthuma*, piperazine citrate and anthelmintic

## Introduction

Helminth infections are among the most common infections in man, affecting a large proportion of the world's population. In developing countries they pose a large threat to public health, and contribute to the prevalence of malnutrition, anaemia, eosinophilia, and pneumonia. Although the majority of infections due to worms are generally limited to tropical regions. Parasitic diseases causing severe morbidity include lymphatic filariasis (a cause of elephantiasis), onchocerciasis (river blindness) and schistosomiasis. These infections can affect most populations in endemic areas with major economic and social consequences. The limited availability and affordability of pharmaceutical medicines mean that the world's population depends to a great extent on traditional medical remedies, and some 20,000 species of higher plants are used medicinally throughout the world (Bundy, 1994).

*Desmodium gangeticum* (Leguminosae) commonly known as Shalparni has been used in folklore medicine in the treatment of various ailments such as a bitter tonic, febrifuge, digestive, antidiarrheal, antiemetic, in inflammatory conditions of chest and various other inflammatory conditions due to 'vata' disorders (Chopra *et al.*, 1956). This plant has been used in Ayurveda for the treatment of various diseases

like typhoid fever, urinary discharges, piles, inflammations, asthma, bronchitis, vomiting, dysentery and hemicranias (Kirtikar *et al.*, 1987). Roots have febrifuge, expectorant, diuretic properties. It is useful also in convulsions (Anil, 2012). The aqueous extract of this species has been reported to show severe analgesic activity, moderate CNS depressant activity and anti-leishmanial activity (Ghosh and Anandkumar, 1981; Iwu *et al.*, 1992).

The literature survey reveals that no reports were found on the anthelmintic activity of the leaves extracts of *Desmodium gangeticum*. This prompted us to investigate the anthelmintic activity of *D. gangeticum* leaves extract.

## Material and Methods

### Collection of Plant Material:

Fresh leaves of *Desmodium gangeticum* (L.) DC. (Leguminosae) were collected from various places of Puttur, India. It was identified and authenticated by Dr. Ravindranath Aithal, Mangalore. Leaves were washed thoroughly under running tap water and shade dried at room temperature and ground mechanically into a coarse powder.

### Preparation of Extract:

60 gm of coarsely powdered leaves were packed in a thimble flask and 500 ml of ethanol was added

in 1 litre round bottom flask. Then the soxhlet assembly was set up to complete 10-15 cycles. The solvent was distilled at low temperature under reduced pressure. The extract was concentrated using water bath to get crude extract which was stored in dessicator for future use.

### Drugs and Chemicals:

Piperazine citrate and other chemicals used were of analytical grade and purchased from local suppliers. All the chemicals were of an analytical grade

### Evaluation of Anthelmintic activity:

Adult Indian earth worms *Pheretima posthuma* obtained from horticulture department, Mangalore, were washed with normal saline to remove all faecal matter. Due to its easy availability, anatomical and physiological resemblance with the intestinal round worms in human beings they have been used for the evaluation of anthelmintic activity. The earthworms of 4-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol.

The anthelmintic assay was carried as per the method of Ajayieoba *et al.*, (2001) with minor modifications. 20 ml formulations containing three different concentrations of ethanolic extracts of *Desmodium gangeticum* leaves (25, 50 and 100 mg/ml in double distilled water) were prepared and taken in different petridishes and six earthworms were placed in the solutions respectively. All the test solution and standard drug solution were prepared freshly before starting the experiments. Piperazine citrate (10 mg/ml) was used as reference standard while distilled water as the control (Dash *et al.*, 2002). Observations were made for the time taken to paralyse or death of individual worm. Paralysis was said to occur when the worms did not revive even in normal saline. Death was confirmed when the worms lost their motility followed by slight discolouration of their normal body colour. Three sets of experiments were done statistical significance.

### Statistical Analysis:

Results were expressed as Mean  $\pm$  SEM Statistical significance was determined by one-way analysis of variance (ANOVA) followed by Dunnett's test, with the level of significance at  $P < 0.05$ .

### Result and Discussion:

From the above study it was seen that the ethanolic extract of *Desmodium gangeticum* showed dose dependent anthelmintic activity as compared to the standard drug piperazine citrate. The mean paralyzing time of *Pheretima posthuma* with the ethanolic extracts of *Desmodium gangeticum* at dose of 25, 50 and 100 mg/ml were found to be 44.70, 32.99 and 22.47 minutes respectively. In meantime piperazine citrate at a dose of 10 mg/ml cause paralysis in the above helminth in 15 minutes. The mean death time of *Pheretima posthuma* with the ethanolic extracts of *Desmodium gangeticum* at dose of 25, 50 and 100 mg/ml were found to be 49.13, 37.31 and 28.42 minutes respectively. Piperazine citrate at a dose of 10 mg/ml cause death in the above helminth in 15.48 minutes. The anthelmintic activity of ethanolic extract of *Desmodium gangeticum* leaves increased significantly ( $P < 0.0001$ ), showing decrease in time of paralysis and death with increase in concentration of extract. The results are summarized in Table:1

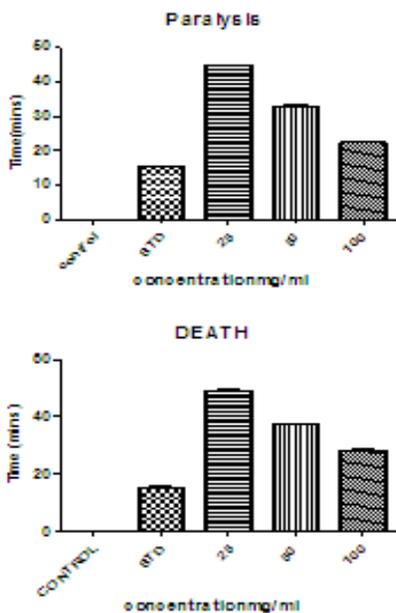
### Conclusion:

The present study of Ethanolic extract of *Desmodium gangeticum* leaves for its Anthelmintic property suggests that it is effective against parasitic infections of humans. It is necessary to identify the active principles responsible for the anthelmintic activity and to study its pharmacological actions.

**Table:1 Anthelmintic activity of Ethanolic extracts of *Desmodium gangeticum* leaves**

Sl No	Groups	Concentration (mg/ml)	<i>Pheretima posthuma</i>	
			Time of paralysis in mins	Time of death in mins
1	Control	---	No paralysis	No death
2	Ethanolic extract of <i>D.gangeticum</i>	25	44.70 $\pm$ 0.06***	49.13 $\pm$ 0.29***
3		50	32.99 $\pm$ 0.26***	37.31 $\pm$ 0.33***
4		100	22.47 $\pm$ 0.13***	28.42 $\pm$ 0.36***
5	Piperazine citrate	10	15.19 $\pm$ 0.10***	15.48 $\pm$ 0.24***

Data were expressed as mean  $\pm$  SEM for 6 worms (n = 6).



## References:

- Bundy, D.A.P. Immunoepidemiology of intestinal helminthic infection I: the global burden of intestinal nematode disease, *Transactions of the Royal Society of Tropical Medicine and Hygiene*.1994;8:259-61.
- Chopra, R.N., S.L. Nayar and I.C. Chopra. *Glossary of Indian Medicinal Plants*. Council of Scientific and Industrial Research, USA.1956; 2nd Edn; Pages: 329
- Kirtikar, K.R. and B.D. Basu. *Indian Medicinal Plants*. International Book Distributors, India,1987; 2nd Edn, pp: 756-760.
- Anil JP. *Desmodium gangeticum*. *Indian medicinal plants; Ayurveda*, 2012 ;1
- Iwu M. M., Jackson J. E., Tally J. D., Klayman D. L., *Planta Med.*, 1992;58:436-41
- Ajaiyeoba EO, Onocha PA, Olarenwaju OT. In vitro anthelmintic properties of *Buchholzia coriacea* and *Gynandropsis gynandra* extract. *Pharm bio*.2001;39:217-20.
- Dash GK, Suresh P, Kar DM, Ganpaty S, Panda SB. Evaluation of *Evolvulus alsinoids* Linn. for anthelmintic and antimicrobial activities. *J Nat Rem*;2002;2:182-5.

---

\* Author for correspondence