

# *in vitro* Anthelmintic Activity of Leaves Extract of *Wrightia tinctoria*

A. Shruthi<sup>1</sup>, K.P. Latha<sup>1\*</sup>, H.M.Vagdevi<sup>1</sup>, V. P. Vaidya<sup>2</sup>, B. Pushpa<sup>1</sup>,  
C. Shwetha<sup>1</sup>

<sup>1</sup>Department of Chemistry, Sahyadri Science College (Autonomous), Shimog,India.  
School of Chemical Sciences, Kuvempu University, Jnana Sahyadri, Shankaraghatta,  
Shimoga,India

\*Corres.author: latha119@gmail.com; Mob: 09448524513.

**Abstract:** Development of anthelmintic resistance and high cost of convectional anthelmintic drugs led to the evaluation of medicinal plants has an alternative source of anthelmintics. The aim of the present study was to determine the anthelmintic activity of crude petroleum ether and chloroform extracts of leaves of *Wrightia tinctoria* using *Pheretima posthuma*. Three concentrations (2.5, 5.0, 7.5mg/ml) of each extracts were studied in the activity, which involved the determination of time of paralysis and time of death of the worms. Piperazine citrate is used as standard reference and normal saline as control. The present study proves the potential usefulness of leaves of *Wrightia tinctoria* as comparable anthelmintic agent.

**Keywords:** *Wrightia tinctoria*, Anthelmintic, Piperazine citrate, *Pheretima posthuma*.

## INTRODUCTION

Helminthes are recognized as a major problem to livestock production throughout the tropics.<sup>1</sup> Infections with helminthes or parasitic worms affect more than two billion people worldwide. These infections can affect most population in endemic areas with major economic and social consequences.<sup>2</sup> Plants are vital for the existence of life in the universe. Man depends upon plants for his food, shelter, and medicines. About 300 species of plants are cultivated for his basic needs, rest of the plants is growing wild in different provinces of the world and many of them are medicinally important. Medicinal plants have always had an important place in the therapeutic armory.<sup>3</sup>

The traditional medicines hold a great promise as source of easily available effective anthelmintic agents to the people, particularly in developing countries, including India. The people consume several plants or plant derived preparations to cure helminthic infections.<sup>4</sup> *Gmelina araborea* Roxb<sup>5</sup>, *Cassia tora*<sup>6</sup>, *Adhatoda vesica*<sup>7</sup> were some of the plants which exhibit anthelmintic activity.

*Wrightia tinctoria* is a member of the family Apocynaceae, is a small to medium-size deciduous tree. The plant grows up to 18 m tall and to 20 cm dbh (Diameter at Breast Height) with green marks on the stem and producing milky-white resin. The bark is smooth, somewhat corky and pale grey.<sup>8</sup> Traditionally *Wrightia tinctoria* commonly called as “Jaundice curative tree” in south India.<sup>9</sup> this plant possesses high medicinal value. Crushed fresh leaves when filled in the cavity of decayed tooth relieve toothache.

In Siddha system of medicine, it is used for psoriasis and other skin diseases.<sup>10-13</sup> The plant has been assigned to analgesic, anti-inflammatory and antipyretic activities<sup>14</sup> and to be effective in the treatment of psoriasis.<sup>15</sup> The literature survey revealed that no reports were found on the anthelmintic activity of the leaves extracts of *Wrightia tinctoria*. This prompted us to investigate the anthelmintic activity of *Wrightia tinctoria* leaves extracts. In the present investigation, the efficacy of petroleum ether and chloroform extracts of *Wrightia tinctoria* leaves was subjected to study anthelmintic activity.

## MATERIALS AND METHOD

### Extraction of Plant Material

The leaves of *Wrightia tinctoria* were collected in the months of May-June from the fields around Shankaraghata, Shimoga district, Karnataka. The plant was authenticated by taxonomist Prof. M.S. Pushpalatha, department of Botany, Sahyadri Science College, Shimoga. Leaves were shade dried and powdered mechanically. The powdered plant material (500g) was first defatted with petroleum ether and then extracted with chloroform by soxhlet extraction process. The extract obtained was filtered and evaporated to dryness under reduced pressure in rotary evaporator.

### Selection of worm

The assay was performed on adult earthworm, *Pheretima prosthuma* due to its anatomical and physiological resemblance with the intestinal round worm parasites of human beings. Because of easy availability, earthworms have been widely used for the initial evaluation of anthelmintic compounds *in vitro*<sup>16-19</sup>. Adult earthworm *Pheretima prosthuma* were collected from a local supplier and maintained at Sahyadri Science College, Shimoga. The earthworms of 3-5cm in lengths and 0.1-0.2 cm in width were used for all the experimental protocol.

### Anthelmintic activity

Petroleum ether and chloroform extracts from the leaves of *Wrightia tinctoria* were investigated for their anthelmintic activity against *Pheretima posthuma*. Various concentrations of each extract were tested in the bioassay, which involved determination of time of paralysis and time of death of the worms. Piperazine citrate was included as standard reference and normal saline as control.

Suspension of the extracts in Tween-80 (0.1%) containing 2.5, 5.0 and 7.5 mg/ml. of the extracts were prepared by adding dextrose (6%) solution. Piperazine citrate containing Tween-80(0.1%) was prepared using dextrose (6%) solution and used as standard reference and normal saline as control.

Four groups of approximately equal size earthworms consisting of three earthworms in each group were used for the present study. Group first serve as control, receive only normal saline, Group second serve as test-1, receive petroleum ether extract, Group third serve as test-2, receive chloroform extract and Group four serve as standard. Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except, when the worms were shaken vigorously. Death was concluded when the worms lost their motility followed with fading away of their body colors.

## RESULT AND DISCUSSION

From the results shown in the Table No1.chloroform extract of leaves of *Wrightia tinctoria* exhibited anthelmintic activity giving shortest time of paralysis and deaths compared to Piperazine citrate especially with 7.5 mg/ml concentration. Petroleum ether and chloroform extract of *Wrightia tinctoria* caused paralysis of 125.83 and 94.5 sec and time of death of 162.33 and 140.28 sec respectively against *Pheretima Posthuma*. The reference drug Piperazine citrate showed the same at 160.85 and 242.5 sec respectively. The predominant effect of Piperazine citrate on worm is to cause a flaccid paralysis those results in expulsion of the worm by peristalsis. Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle to relaxation and flaccid paralysis<sup>20</sup>. The values are showed in Table 1.

**TABLE NO. 1: ANTHELMINTIC ACTIVITY OF PETROLEUM ETHER AND CHLOROFORM EXTRACTS OF LEAVES OF *WRIGHTIA TINCTORIA*.**

Test samples	Concentration (mg/ml)	Time taken for paralysis(P) and death(D) (in seconds)	
		P	D
Control	-	-	-
Petroleum ether extract	2.5	172.00±13	360.17±15
	5.0	137.85±12	191.50±04
	7.5	125.83±05	162.33±15
Chloroform extract	2.5	180.83±06	272.67±19
	5.0	127.17±11	194.60±05
	7.5	94.50±13	140.12±33

Results are expressed as mean ± SEM for the above observations.

## CONCLUSION

It was concluded that chloroform and petroleum ether extract of leaves of *Wrightia tinctoria* possess potent anthelmintic activity by exhibiting effectiveness for the parameters studied. In the light of the above, further investigation is warranted in order to identify the specific molecules which are responsible for the biological activity.

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