



### EVALUATION OF ANTHELMINTIC ACTIVITY OF PINEAPPLE FRUIT EXTRACT USING INDIAN EARTHWORM (*PHERITIMA POSTHUMA*)

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#### ABSTRACT

Pineapple is a favorite for the lovers of fruit in its fresh forms as well as in preserves like jams, jellies and squashes. Two varieties of Pineapples (Queen and Kew) are available in Tripura during mid-May to mid-September. The plant is well known for its different folk medicines like the root and fruit are either eaten or applied topically as an anti-inflammatory, digestive and anthelmintic. It was observed that the people of Tripura especially the Tribes are use the juice of matured root or fruit in worm. Research shows that, mainly bromelain is responsible for all its therapeutic activity. The agriculture of Tripura, each year, gets a special boost from pineapple production between the middle of May and middle of September, both inclusive. Pineapple's leaves are used as the source of a textile fiber and are employed as a component of wall paper and furnishings, amongst other uses. This allows the crop to contribute a significant proportion in the economy of the state. The present study was carried out to evaluate the anthelmintic activity of fruit extract (Aqueous) of Pineapple using Indian earthworm (*Pheretima posthuma*). All the extracts were found not only to paralysis (vermifuge) but also to kill the earthworms (vermicidal). But the concentration of 40mg/ml fruit extract showed the maximum effect in respect of 20 and 10 mg/ml.

**Key words:** Anthelmintic activity, Pineapple, *Pheretima posthuma*, Bromelain, Vermifuge, Vermicidal.

#### INTRODUCTION

The World Health Organization estimates that a staggering two billion people harbor parasitic worm infections<sup>1</sup>. Helminthiasis is still one among the most important human and animal diseases<sup>2</sup>. During the past few decades, despite numerous advances made in understanding the mode of transmission and treatment of these parasites, there are still no efficient products to control certain helminthes and several the indiscriminate use of some drugs are generated several cases of resistance. As an important component of complementary and alternative medicine, traditional Ayurvedic medicinal plants may be useful to discovery and development of new chemical substance for helminthes control which are generally considered to be very important sources of bioactive substances<sup>3</sup>.

The aim of the present study is to evaluate the in vitro anthelmintic activity of Pineapple fruit extract.

#### MATERIALS AND METHODS

##### Plant material collection

Pineapple was collected from different parts of the state. The fruits were washed with fresh water and extracts were prepared by distilled water.

##### Selection of worms

Indian adult earthworms (*Pheretima posthuma*) were used to carry out the anthelmintic evaluation. The earthworms were collected from the moist soil of Durjainagar. Worms were washed with saline water to remove the faecal matter. Worms were of about 11 cm length and 0.3 to 0.4 cm wide was selected for the experiment. Ready availability, anatomical and physiological resemblance of *Pheretima posthuma* made it to be used initially for in vitro evaluation of anthelmintic activity<sup>4, 5, 6, 7</sup>.

##### Drugs and chemicals

Albendazole suspension [Zentel (micronized albendazole), Glaxo Smithkline Pharmaceuticals Ltd., Bangalore] and Methanol [Loba chemie pvt. Ltd, Mumbai] and petroleum ether [Merck Ltd., Mumbai] were used during the experimental protocol.

#### Evaluation of anthelmintic activity

Anthelmintic activity was carried out on adult Indian earthworm (*Pheretima posthuma*) of nearly equal size, six in each group. Extract was suspended in 1% w/v CMC (Carboxy Methyl Cellulose) solution prepared in distilled water to obtain concentration of 10, 20, and 40 mg/ml. Reference standard albendazole suspension (40 mg/ml) was diluted by the same suspending agent to obtain concentration of 20 and 10 mg/ml. Worms were placed in petridishes containing 15 ml of sample solution. Time for paralysis was noted either when any movement could not be observed except when the worms were shaken vigorously or when dipped in warm water (50°C). Death was included when the worms lost their motility followed with white secretion and fading away of their body colours<sup>8</sup>.

#### RESULTS AND DISCUSSION

All the concentration showed significant anthelmintic activity at all tested doses when compared to reference standard (table 1) as vermifuge and vermicide. But 40 mg/ml concentration shows more action than others. Potency of the extract was inversely proportional to time for paralysis and death of worms.

**Table 1: Anthelmintic Activity of AFE of Pineapple Leaves**

Groups	Concentration (mg/ml)	Time(min)	
		Paralysis	Death
Control	—	—	—
Standard (Albendazole)	10	4.45 ± 0.22	26.13 ± 0.28
	20	3.35 ± 0.16	12.91 ± 0.58
	40	2.83 ± 0.21	10.80 ± 0.47
	10	99.87 ± 0.74	118.04 ± 0.83
	20	79.86 ± 0.81	109.79 ± 0.73
AFE	40	68.78 ± 0.77	92.03 ± 0.77

Values are expressed a mean ± SEM, n=6, AFE: aqueous fruit extract

## CONCLUSION

Finally, it can be concluded that all concentration of fruits shows significant anthelmintic activity. Further study can be continued for in vivo evaluation of some species other than *Pheretima posthuma* followed by isolation and characterization of the particular chemical moiety for the activity.

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