

In-Vitro Anthelmintic Activity of Ethanolic Leaf Extract of *Luffa acutangula* on Indian Earthworms *Pheretima posthuma*

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Original Research Article

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Article History

Received: 10.12.2017

Accepted: 25.12.2017

Published: 30.01.2018

DOI:

10.36347/sjams.2018.v06i01.059



Abstract: Anthelmintic activity of ethanolic leaf extract of *Luffa acutangula* was studied against *Pheretima posthuma*. Three concentrations (10, 20 and 50mg/ml) of *Luffa acutangula*, Piperazine Citrate (15mg/ml) and Albendazole (20mg/ml) were used in the study. For control group, normal saline was used. In each group, 6 worms were used and the time taken for paralysis and death were recorded after exposing the worms in the above tested samples. Results showed that, ethanolic leaf extract of *Luffa acutangula* showed comparable paralysis and death of worms in respect to reference controls Albendazole and Piperazine Citrate. From the results it was concluded that, ethanolic leaf extract of *Luffa acutangula* exhibited anthelmintic activity against *Pheretima posthuma*.

Keywords: *Luffa acutangula*, Anthelmintic, *Pheretima posthuma*, Albendazole, Piperazine Citrate.

INTRODUCTION

Intestinal worm infestations are widely prevalent in tropical and subtropical countries and occur where there is poverty and poor sanitation. According to World Health Organization (WHO), globally there are 1221–1472 million cases of Ascariasis, 750–1050 million cases of Trichuriasis and 740–1300 million cases of hookworm infestation [1]. These intestinal worm infestations are also considered Neglected Tropical Diseases (NTDs) as they inflict considerable morbidity and mortality, though entirely preventable. The burden of disease due to these intestinal parasites is an estimated 22.1 million disability-adjusted life-years lost for hookworm, 10.5 million for Ascaris; and 6.4 million for Trichuris [2].

Approximately 10,500 deaths each year are due to complications of Ascariasis and 65,000 deaths per year are due to anaemia caused by hookworm infection [3]. WHO recommends periodic administration of albendazole or mebendazole for control of Intestinal worm infestations [4]. The study of medicinal plants as a new approach for schistosomiasis treatment is feasible and promising one. The research on medicinal plants is encouraged by the WHO, considering that certain traditional knowledge on curative aspects of plants could add up to the development of new drug against diseases that affects the populations of developing countries.

Luffa acutangula L., belongs to the family Cucurbitaceae, is commonly known as ridge gourd and it is used as vegetable in Asian countries. Chemical constituents of *L. acutangula* mainly include carbohydrates, carotenoids, fat, protein, phytin, amino acids, piperolic acid, flavonoids and saponins. The ethnobotanical survey revealed that very fine powder of

fruits of *L. acutangula* is used as a snuff to protect jaundice. A powder of the fruit is used for rubbing on the swollen hemorrhoids. Kernel of the seeds is soft smooth and an efficient remedy for dysentery while the juice of roasted young fruit is applied to cure headache. Traditionally the plant has diuretic properties; used as an expectorant, laxative and purgative; hypoglycemic agent, bitter tonic; used in the enlargement of spleen. The roots of ridge gourd added to milk or water is helpful in the removal of kidney stones. The roots of ridge gourd are added to cooled water, boiled and applied on skin in the swelling of the lymph glands. The leaves of the ridge gourd are useful in the treatment of dysentery. The leaves or juice of the ridge gourd are used as dressing in the diseases such as inflammation of spleen, ringworms, piles and even in leprosy. Pounded leaves mixed with garlic are applied locally for a relief in leprosy and used to eliminate intestinal worms. Oil is extracted from the seeds of ridge gourd and used in the treatment of skin diseases[5]. Various parts of *Luffa acutangula* was reported to have different activities like

hepatoprotective [6], antidiabetic [7], antiulcer [8], antiproliferative and anticancer [9], antioxidant[10], analgesic [11], fungistatic [12], antimicrobial[13] activity. The study was conducted to evaluate the anthelmintic activity of the ethanolic leaf extract of *Luffa acutangula* using against *Pheritima posthuma*.

MATERIALS AND METHODS

Plant material

The leaves of *Luffa acutangula* were collected from the local farm of pondicherry. It was identified and authenticated as *Luffa acutangula* by Scientist ‘F’ Botanical survey of India, Southern Regional Centre, Tamilnadu Agriculture University, Coimbatore. The voucher specimen (BSI/SRC/12/42/2017-18/Sci/01203) has been deposited in department for further references.

Preparation of Extract

The leaves of *Luffa acutangula* were washed, dried and cut into small pieces. The roots were shade dried and subjected to steam distillation. The distillate collected was subjected to extraction with ethanol. The resulted ethanolic extract was dried, and stored in airtight container, protected from light.

Collection of Earth Worms

Indian adult earth worm (*Pheritima posthuma*) was collected from water logged areas of Kancheepuram. The worm type was identified at the department of Zoology, Bharathiyar University, Coimbatore.

Evaluation of Anthelmintic Activity

The anthelmintic activity was evaluated on adult Indian earthworm *Pheritima posthuma* (14). Six groups of worms were used to assess the anthelmintic properties of ethanolic extracts of *Luffa acutangula*.

Group 1 were the control worms placed in normal saline; groups 2-4 were treated with 10, 20 and 50 mg/ml of ethanolic extracts *Luffa acutangula* in normal saline; group 5 with Piperine citrate in normal saline; and group 6 with Albendazole in normal saline. Each group included six worms. Observations were made for the time taken to set paralysis and death of the individual worms. Mean time for the paralysis (P) in min. was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; time of death (D) in min. was recorded after ascertaining the worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (15 mg/ml), albendazole (20 mg/ml) were included as reference compound.

RESULT

Anthelmintic activity of ethnolic leaf extract of *Luffa acutangula* was studied in *Pheritima posthuma* and the results were shown on table 1. The time taken for paralysis and death were observed after placing the worms in various concentrations of *Luffa acutangula* and with the effect of reference control Piperazine Citrate and Albendazole. The worms placed in normal saline didn't show any paralysis or death. The worms placed in 10mg/ml of *Luffa acutangula* showed paralysis at 55.16 minute and death occurs at 85.36 minute. At 20mg/ml concentration of *Luffa acutangula* showed 22.37 minute and 31.42 minutes for paralysis and death respectively. The time taken for paralysis and death at 50mg/ml was 2.54 minute and 3.02 minutes respectively. The anthelmintic effect produced by the higher concentration of *Luffa acutangula* (50mg/ml) was found to be more as compared to the reference control Piperazine citrate and Albendazole.

Table 1. Shows the anthelmintic activity of ethanolic leaf extract of *Luffa acutangula* against *Pheritima posthuma*

S.No	Groups & Drug Treatment	Time Taken for Paralysis (P) and Death (D) of <i>Pheritima posthuma</i> (Min)	
		Paralysis (P)	Death (D)
1	Group I Control	A	A
2	Group II <i>Luffa acutangula</i> (10mg/ml)	55.16±1.43	85.36±3.38
3	Group III <i>Luffa acutangula</i> (20mg/ml)	22.37±1.06	31.42±2.43
4	Group IV <i>Luffa acutangula</i> (50mg/ml)	2.54±0.14	3.02±0.15
5	Group V Piperazine Citrate(15mg/ml)	5.28±0.33	6.12±0.32
6	Group V Albendazole (20mg/ml)	2.35±0.11	3.11±0.22

Values are in mean ± SEM (n=6),

‘A’ indicates absence of activity in 24 h of administration.

CONCLUSION

The ethanolic leaf extract of *Luffa acutangula* studied for anthelmintic activity against *Pheritima posthuma*. From the results it was concluded that, *Luffa acutangula* leaf extract exhibited anthelmintic activity.

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