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Research Article

EVALUATION OF ANTHELMINTIC ACTIVITY OF *MANIHOT ESCULENTA* LEAVES.

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ABSTRACT

The present study was designed to explore the anthelmintic activity of different extracts of leaves of Manihot esculenta using petroleum ether, ethyl acetate methanol and water as solvents. Various concentrations (25 and 50mg/ml) of all the extracts were tested, which involved determination of time of paralysis and time of death of the worms. It was compared with Albendazole as standard reference and normal saline as control. The study indicated the potential usefulness of Manihot esculenta against earthworm infections.

Keywords: Anthelmintic activity, *Manihot esculenta*, Albendazole.

INTRODUCTION

Helminthiasis is among the most important animal disease inflicting heavy production losses. The disease is highly prevalent particularly in third world countries[1] due to poor management practices. Chemical control of helminthes coupled with improved management has been the important worm control strategy throughout the world. However, increasing problems of development of resistance in helminthes[2] against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity. The plants are known to provide a rich source of botanical anthelmintics[3]. A number of medicinal plants have been used to treat parasitic infections in man and animals[4].

The cassava plant (*Manihot esculenta* Crantz, family Euphorbiaceae) is one of the staple food crops in most regions of Africa, Asia, and Latin America[5]. The parts of the plant that are commonly utilized are the roots and leaves. Cassava leaves have also been used against many disorders, such as rheumatism, fever, headache, diarrhea, and loss of appetite[6, 7] leaves reportedly also possess anti-hemorrhoid, anti-inflammatory[8] and antimicrobial activity[9]. In India, cassava is used for the treatment of ringworm, tumor, conjunctivitis, sores and abscesses.

Literature review indicates that anthelmintic activity of this species has not been clinically evaluated so far. The present paper reports the anthelmintic activity of fruit extract of *Manihot esculenta* against Earthworms.

MATERIALS AND METHODS

Plant material

The fresh leaves of *Manihot esculenta* were collected from the Kurnool (Dt) and authenticated by Botanist, Dr. P. Jayaraman, Plant Anatomical Research Centre (PARC), Tambaram, Chennai and the voucher specimen was kept in the Department of Pharmacognosy, Safa College of Pharmacy, B.Tandrapadu, Kurnool. Andhra Pradesh, India.

Extraction of plant drug

The collected leaves were washed, shade dried and converted into moderately coarse powder by mechanical grinder. The powdered material was extracted successively with petroleum ether (40- 60°), ethyl acetate, methanol and water by using soxhlet apparatus. The solvent was removed under reduced pressure which yields different successive extracts in the form of semisolid mass.

Collection of worms

Indian adult Earthworms (Pheretima posthuma) were collected from the moist soil near Safa College of pharmacy. Selected earthworms are 4-6 cm in length and 0.1-0.2 cm in width. The earthworms were washed with normal saline to remove all the faecal matter.

Preparation of test samples

Test samples of the extract were prepared at the concentrations, 25 and 50 mg/ml in distilled water.

Anthelmintic Assay

The anthelmintic activity was performed according to the method of Ghosh *et al* [10] on adult Indian earthworm *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal round worm parasites of human beings. Twenty four earthworms were placed in petri dish and two different concentrations (25 and 50 mg/ml) each of crude extract of petroleum ether, ethyl acetate, methanol and water were poured and observed for paralysis and death. The mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously and death was concluded when the worms lost their mortality followed with fading away of their body colour[11, 12].

Statistical analysis

The result were express as Mean ± SEM. Statistical analysis was carried out using one way ANOVA followed by Student-t test.

RESULTS AND DISCUSSION

Anthelmintic activity of *Manihot esculenta* is confirmed by examining the time taken for paralysis (P) and death (D) for Pheretima posthuma worms were reported in Table 1. As shown in Table 1, methanolic extract of *Manihot esculenta* exhibited anthelmintic activity in dose dependent manner taking shortest time for paralysis (P) and death (D) with 50mg/ml concentration. From the above results, it was observed that methanolic extract was more potent than the other three extracts (petroleum ether, ethyl acetate and water) even though chloroform and ethyl acetate extracts were not accomplished with anthelmintic property when compared with control and standard group. Thus, the activity revealed concentration dependence nature of the different extracts. It could be concluded that methanolic extract of *Manihot esculenta* showed most potent anthelmintic activity. Further studies are required to identify the actual chemical constituents that are present in the crude extract of this plant which are responsible for anthelmintic activity.

Table 1: *In vitro* anthelmintic activity of various extracts *of* *Manihot esculenta* Leaves

Groups	Concentration Used (mg/ml)	Time taken for Paralysis (min)	Time taken for Death (min)
Control	25	-	-
(Normal saline)	50	-	-
Standard	25	22.75±1.552	39.61±0.524
(Albendazole)	50	19.65±2.458	24.98±2.545
Chloroform extract	25	35.65±1.621	26.69±2.012
	50	21.52±2.561	22.61±2.643
Ethyl acetate extract	25	18.24±2.467	29.04±0.451
	50	12.03±1.429	24.75±0.913
Methanol extract	25	5 5.06±0.841	7.21±0.823
	50	4.26±0.146	6.25±0.628
Aqueous extract	25	30.12±1.452	72.14±1.491
	50	50 22.54±1.504	62.81± 2.214

Each value represents mean ± SEM (N=2) in each concentration and each groups.

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