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In vitro Anthelmintic activity of *Mollugo pentaphylla* L.

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ABSTRACT: Ethanolic extract and its fraction of the aerial part of *Mollugo pentaphylla* L. were investigated for their anthelmintic activity against *Pheritima posthuma* and *Ascardia galli.* The study involves the determination of paralysis time and death time of the worms in the different doses of the extracts (12.5, 25 and 50 mg/kg). The extracts and its fractions exhibited significant anthelmintic activity in a dose dependent manner compared to the control. Activity was comparable with the reference stand pipeazine citrate (15 mg/ml) and Albendazole (20 mg/ml).

Key words: Anthelmintic activity, *Mollugo pentaphylla* L., *Ascardia galli*, *Pheritima posthuma*, Piperazine citrate, Albendazole.

INTRODUCTION

Mollugo pentaphylla L. is commonly known as pita gohun in Orissa .It belongs to family Molluginaceae. The plant is distributed through out India, Ceylon, Malacca, China, Japan and Fiji. It is found ascending to 1500m tropics and sub tropics of the whole world. It is fairly a common weed in cultivated land, road sides and waste land all the year round. The plant is erect, slender, glabrous herb, the leaves are variable in shape. The plant is indigenous to India and has a lot of therapeutic importance in the ancestral system of medicine. The plant is highly esteemed in India as bitter vegetable, eaten occasionally on account of its stomachic, aperient and antiseptic properties. An infusion of the plant is given to women to promote the menstrual discharge. It is used as blood purifier, improves digestion, stimulate the action of liver and cures burning sensation and skin diseases. Traditionally, the plant is also used as diuretic, anthelmintic, digestive, constipating, spermicidal, antioxidant, antimalarial and antiviral property [1, 2]. On account of its use as anthelmintic as well as bitter vegetable, this study was undertaken to evaluate the anthelmintic potential of plant *Mollugo pentaphylla* L.

MATERIALS AND METHODS[3-6]

Plant material

The plant *Mollugo pentaphylla* L. were collected from the rural belt of Salipur district, Cuttack in June 2008 and authenticated by (Govt.of India) Botanical survey of India.

Preparation of extracts

The plants were shade dried, powdered. The powdered material was defatted with petroleum ether (60-80ºC). Then the powdered material was extracted with ethanol and extract was vacuum dried. Then subtraction was carried out by ethyl acetate and n-butanol. Standard methods were used for preliminary phytochemical screening of the ethanolic extract and its fractions to know the nature of phytoconstituents present in it.

Animals

Indian adult earth worm (*Pheritima posthuma*) was collected from water logged areas of Salipur and *Ascrdi galli* (nematode) worm were obtained from freshly slaughtered fowls (*Gallus gallus*). Both worm types were identified at the department of Zoology, Utkal University, Bhubaneswar.

Evaluation of anthelmintic activity

The anthelmintic assay was carried as per method of Ajaiyeoba et al. with minor modifications.[6]The anthelmentic activity was evaluated on adult Indian earthworm *Pheritima posthuma* worm parasites of human beings *Ascardia galli*_(nematodes) worms available in slaughtered fowls. Three different concentrations of crude etanolic,

ethyl acetate and n-butanol fraction (12.5, 25 and 50 mg/ml in 1% gum acacia in normal saline) were prepared and six worms (of each type) were placed in it. Observations were made for the time taken to cure 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 (50ºC) . Piperazine citrate (15 mg/ml), albendazole (20 mg/ml) were included as reference compound.

RESULT AND DISCUSSION

Results of the preliminary phytochemical screening are shown in Table I. It indicates that the extracts and its fractions contains following constituents. In the evaluation of anthelmintic activity (Table II), ethanolic extract and its fractions of *Mollugo pentaphylla* L. not only produce paralysis but also cause death of both species of worms in a dose dependent manner. The order of activity was ethanolic extract > ethyl acetate fraction > n-butanol fraction. Among the standards used, Piperazine citrate causes flaccid paralysis of worms that resulting expulsion of worms by peristalsis. Although it dose not causes death of worms on the other hand Albendazole inhibits tubulin polymerization in the parasite and blocks glucose up take. The reduced energy level causes death of the parasite[3]. These effects were shown for the standard drugs. It was observed that the anthelmintic effect of extract and its fractions were comparable with the standard drugs used, although they caused paralysis as well as death of the worms similar to Albendazole. It can be concluded that the extract and its fractions of the plant *Mollugo pentaphylla* L. have profound anthelmintic activity against tested worm species. These findings justify the traditional use of this plant as anthelmintic. Further studies are needed to establish the mechanism of action and isolation of phyto constituents responsible for the concerned activity.

TABLE 1: PHYTOCHEMICAL SCREENING OF MOLLUGO PENTAPHYLLA L.

Type of extract	Constituents present
Ethanolic extract	Alkaloids, carbohydrates, proteins and amino acids.
Ethyl acetate fraction	Glycosides, steroids, triterpenoids and saponin.
N-butanol fraction	Glycosides, tanins, phenolic compounds, flavonoids, triterpenoids and saponin.

TABLE II: ANTHELMINTIC ACTIVITY OF ETHANOLIC EXTRACT AND ITS FRACTIONS OF *MOLLUGO PENTAPHYLLA* L.

Sample	Concentrations (mg/ml)	Time taken for paralysis (P) and death (D) of worms in (mins)			
		P. posthuma		*A. galli*	
		P	D	P	D
Control	-	-	-	-	-
Ethanol extract	12.5	22.33 ± 0.42	65.17 ± 0.97	13.58 ± 0.71	40.34 ± 0.43
	25	12.67 ± 0.41	30.00 ± 0.71	7.71 ± 0.54	18.57 ± 0.67
	50	5.35 ± 0.33	12.75 ± 0.31	3.25 ± 0.88	7.89 ± 0.24
Ethyl acetate fraction	12.5	26.67 ± 0.84	70.72 ± 0.88	16.23 ± 0.45	45.73 ± 0.73
	25	16.44 ± 0.73	45.72 ± 0.74	11.56 ± 0.33	31.75 ± 0.18
	50	7.00 ± 0.68	19.33 ± 0.58	5.34 ± 0.86	12.16 ± 0.78
N-Butanol fraction	12.5	A	A	A	A
	25	52.17 ± 0.71	A	31.72 ± 0.58	A
	50	30.00 ± 0.53	42.33 ± 0.78	18.24 ± 0.34	26.20 ± 0.56
Piperazine citrate	15	18.00 ± 0.36	A	8.43 ± 0.57	A
Albendazole	20	34.66 ± 0.72	63.83 ± 0.79	20. 54 ± 0.16	35.56 ± 0.28

Results are expressed as mean ±SEM (n=6). 'A' indicates absence of activity.

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