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EVALUATION OF ANTHELMINTIC ACTIVITY OF *RICINUS COMMUNIS* LINN. LEAVES BY USING DIFFERENT TYPES OF SOLVENT

Nirmale Dnyaneshwar Mahadev* and Balakshe Prajkta Vitthal

Yashoda Technical Campus, Satara Faculty of Pharmacy, Satara - 415015, Maharashtra, India.

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Correspondence to Author:

Mr. Nirmale D. Mahadev

Assistant Professor,
Yashoda Technical Campus, Satara
Faculty of Pharmacy, Satara - 415015,
Maharashtra, India.

E-mail: balakshep@gmail.com

ABSTRACT: Aqueous and ethanol ethyl acetate chloroform-methanol extracts from the leaves of *Ricinus communis* were investigated for their anthelmintic activity against *Pheretima posthuma* and three concentrations (50, 75 and 100 mg/ml) of each extract were studied for activity, in which paralysis and death time of the worm. Both the extract exhibited remarkable anthelmintic activity at all three concentrations. Albendazole suspension is used as standard reference (20 mg/ml) and distilled water as control. Therefore the aqueous and ethanol methanol extract of leaves of *Ricinus communis* has been demonstrated for the first time.

INTRODUCTION: Helminthiasis or worm infection is one of the most prevalent diseases in the World¹. The disease is highly prevalent particularly in third world countries due to poor management practices². The word Helminthes has been derived from the Greek which means 'worm.' Helminths infections are among the most common infections in man, affecting a large proportion of the world's population. The parasites can be acquired by contact with a) infected water b) infected meal c) infected animal³. In developing countries, they pose a large threat to public health and contribute to the prevalence of malnutrition, anemia, eosinophilia, and pneumonia⁴. Helminthiasis is a macro parasitic disease of humans and animals in which a part of the body is infested with parasitic worms such as pinworm, roundworm, or tapeworm⁵.

The World Health Organization (WHO) estimated that 80% of the population of developing countries relies on traditional medicines, mostly plant drugs for their primary health care needs. The use of the medicinal plant is growing worldwide because of the increased toxicity and allergic manifestations of synthetic drugs. Hence, there is an increasing demand towards natural Anthelmintic⁶.

Ricinus communis also known as Castor oil plant belongs to family Euphorbiaceae. This plant is native of India, and it has spread thence over all the warmer countries of the world⁷. It is an annual or perennial bush or occasionally a soft-wooded small tree grown up to 6 m or more found nearly throughout India, Brazil, South Africa and Russia⁸. In the Indian system of medicine, the leaf, root and seed oil of this plant have been used for the treatment of inflammation, liver disorders, hypoglycemic and laxative⁹. Castor oil is widely used as a cathartic, and also for lubrication and illumination. Roots are administered in the form of a decoction for lumbago and the form of a paste for toothache⁷. The stem of *Ricinus communis* has anticancer, antidiabetic and antiprotozoal activity¹⁰.

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The literature review indicates that the Anthelmintic activity on the leaves of *Ricinus communis* has not been evaluated so far and thus this paper reports the Anthelmintic activity on the extract of leaves of *Ricinus communis* L. against earthworms.

Authentication of Plant Material: The fresh leaves of *Ricinus communis* were collected from the Malshiras District Solapur, Maharashtra and authenticated head of the department of Yashvantrao Chavan Institute of Sciences, Satara.

Preparation of Extract: The leaves of *Ricinus communis* was subjected to shade drying. The dried bark was further crushed into powder and then stored in airtight containers for further analysis. Crude extract of leaves was prepared by ultrasonication extraction method. About 125 mg of powdered plant material was uniformly packed into a thimble and extracted with solvents (2 liters each). Solvents used were ethanol, water, ethyl acetate chloroform-methanol then the beaker is kept in a sonicator for sonication extraction for time 60 min respectively. After the sonication filter, the extract then collect in different Petri plates and keep the Petri plates for evaporation at room temperature. Then collect all the extract keep in the refrigerator.

Standard Used for the Activity: Albendazole suspension in the concentration of 20mg/ml mfg. by Cipla Ltd. used as the reference standard.

Animals: Earthworms (*Pheretima posthuma*) of about 4-5cm long were used for the anthelmintic activity, collected from Department of Agriculture, Satara.

Method: All the glass wares previously washed were sterilized in a hot air oven. Petri-dishes, pipettes, test tube was wrapped separately in the

paper and kept in the hot air oven for sterilization at 180 °C for 1 h. Take 10 gm of powdered drug of night jasmine in 4 different beakers and then add 50 ml of ethanol in each baker. Then the beaker is kept in a sonicator for sonication extraction for time 60 min. The Anthelmintic assay was carried out as per the method of Deore *et al.*, with minor modifications¹². Earthworms were used for Anthelmintic activity grouped into control, standard, and aqueous, ethanol, methanol-ethyl acetate, chloroform, extract, four animals in each group having length 4-5 cm.

Albendazole was used as standard, where distilled water as a control. In the first set of experiment, seven groups of four earthworms were released into 25 ml of solutions of aqueous and ethanol extracts of bark of *Ricinus communis* Linn. (50, 75 and 100 mg/ml each) in distilled water. They were observed for their spontaneous motility and evoked responses. The time required for paralysis and death of animals was noted for each sample. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. The death of the worm was ascertained by transferring it into a beaker containing hot water (50 °C), which stimulated and induced movements if the worm was alive. The death and total paralysis time was recorded at room temperature.

RESULT AND DISCUSSION: The result of Anthelmintic activity is shown in **Table 1**. In the present study ethanol, aqueous, methanol, ethyl acetate-chloroform the extracts showed remarkable Anthelmintic activity against intestinal parasitism.

All extract shows paralysis as well as the death of worms in less time than ethanol, methanol, and aqueous extract especially at higher concentration of 100 mg/ml.

TABLE 1: RESULTS OF ANTHELMINTIC ACTIVITY OF *RICINUS COMMUNIS* L. EXTRACTS

Extract	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Ethanol	50	20.50 ± 1.25	70.01 ± 0.50
	75	17.20 ± 0.54	32.50 ± 1.25
	100	9.50 ± 0.69	30.50 ± 0.44
Aqueous	50	18.56 ± 0.58	81.50 ± 1.55
	75	17.22 ± 0.25	43.45 ± 0.76
	100	9.05 ± 0.62	31.07 ± 0.56
Ethyl acetate	50	40.30 ± 1.22	98.24 ± 0.77
	75	35.41 ± 0.12	60.01 ± 0.41
	100	22.05 ± 0.56	40.99 ± 0.52

Chloroform	50	35.03 ± 0.67	97.11 ± 0.76
	75	28.44 ± 1.20	70.05 ± 0.44
	150	20.22 ± 0.70	45.90 ± 0.72
Methanol	50	26.03 ± 0.60	85.60 ± 0.46
	75	19.47 ± 1.12	60.05 ± 0.76
	100	11.75 ± 0.70	35.50 ± 0.44
Control	-	-	-
Albendazole	20	8.30 ± 0.60	40.21 ± 1.04

CONCLUSION: It can be concluded that the leaves of *Ricinus communis* possess Anthelmintic activity against the worms and hence further investigation of active principles might help in finding of new compounds, which will be effective against parasitic infections.

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CONFLICT OF INTEREST: Nil

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