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Research Article

ANTHELMINTIC ACTIVITY OF METHANOLIC EXTRACT OF RHIZOMES OF *PICRORRHIZA KURROA* ROYAL EX. BENTH

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ABSTRACT

The objective of this study is to evaluate and compare the Anthelmintic activity of methanolic extract of *Picrorrhiza kurroa* Royle ex. Benth (Scrophhulariaceae). *Picrorrhiza kurroa* is a small perennial herb growing in the hilly parts of the North-western Himalayan region in India and Nepal. Earth worms were used for Anthelmintic activity. Piperazine citrate was used as standard drug. Time required for paralysis and death of the earth worms were noted for each sample.

Keywords: *Pheretima posthuma*, Piperazine citrate, *Picrorrihza kurroa*, Anthelmintic activity.

INTRODUCTION

Picrorrhiza kurroa Royle ex. Benth. Belonging to the family Scrophulariaceae is a small perennial herb that is widely distributed in the North-west India on the slopes of Himalayas between 3000 and 5000 meters[1,2]. *Picrorrhiza kurroa* is valued as hepatoprotective, Anti-periodic, Cholagouge, Stomachic, Anti-amoebic, Anti-oxidant, Anthelmintic, Anti-inflammatory, Cardiotonic, Laxative, Carminative, Expectorant etc[3,4]. On account of its use as Anthelmintic as well as bitter, this study was undertaken to evaluate the Anthelmintic potential. Anthelmintics are the drugs that expel parasitic worms from the body either by paralyzing of killing them[5]. Helminth infections are now being recognized as the cause of many acute as well as chronic ill healths among the various human beings as well as cattle's. More than half of the population of the world suffers from infection of one or the other and majority of cattle population suffer from worm infections[6]. The objective of the present study is to evaluate Anthelmintic activity of methanolic extract of rhizomes of *Picrorrhiza kurroa* plant.

MATERIALS AND METHODS

Authentication of the Plant Material

The plant specimen was collected from S.V University; Tirupati, India and has been identified as *Picrorrhiza kurroa* Royle ex. Benth. Belonging to the family Scrophulariaceae, Voucher No: SDIP, Ref No: 002 dated 26/10/2012 and authenticated by Dr. K. Madhava chetty, Botanist, Tirupati, India. The rhizomes of the plant were dried in vacuum oven at 40^{o}C.

Preparation of the Plant Extract

Rhizomes of *Picrorrhiza kurroa* plant are coarsely powdered and are successively extracted by continuous hot percolation method using Soxhlet apparatus employing chloroform and methanol. Methanolic extraction yielded sufficiently good quantity of the product. From the dried methanolic extract, accurately 20 mg / ml, 40 mg / ml, 60 mg / ml, 80 mg / ml, 100 mg / ml, 120 mg / ml solutions were prepared using distilled water.

Standard used for the Activity

Piperazine citrate is used as the standard to compare the test results. The standard drug was prepared in the concentrations of 10 mg / ml using distilled water as solvent.

Animals

Adult earth worms (*Pheretima posthuma*) of about 6-8 cms long were chosen for Anthelmintic activity.

Method

The Anthelmintic assay was carried as per the method of Ajaiyeoba *et.al*. with minor modifications[7]. The Anthelmintic activity was evaluated on Indian adult worms (*Pheretima posthuma*) available at a nearby vermin culture plant. Six different concentrations i.e. 20 mg / ml, 40 mg / ml, 60 mg / ml, 80 mg / ml, 100 mg / ml, 120 mg / ml of test drug and 10mg/ml of standard were prepared in different petri dishes. Six worms were placed in each petri dish. Observations were made for the time taken (in minutes) for paralysis / immobility and death of individual worms in all the 12 petri dishes. Death of the worm was ascertained when the worm showed no further movements upon transferring the worm into a beaker containing hot water at 50^{o}C or pricking it by a ball pin, which stimulated or induced movements if the worm was alive.

RESULTS AND DISCUSSION

Results of preliminary phytochemical screening showed the presence of carbohydrates, glycosides, saponins, steroids like phytochemical constituents. Cucurbitacins, Phenolic, Iridoid glycosides are some of the principle constituents responsible for various pharmacological activities. Iridoid glycosides like kutkin, Picroliv, Picrisides I, II, III and IV, Kutkosides are the chemical moieties thet may be responsible for Anthelmintic activity[8]. The Table no: 01 reveals that the methanolic extract obtained from the rhizomes of *Picrorrhiza kurroa* are active against earth worm. Methanolic extract of *Picrorrhiza kurroa* rhizomes showed good Anthelmintic activity in a dose dependent manner. The Anatomy and Physiology of *Pheretima posthuma* is similar to that

Helminthes[9]. Therefore earth worms were used in this study. It has been demonstrated that all Anthelmintics are toxic to earth worms, and a substance toxic to earth worm is worthy for investigation as an Anthelmintic[10]. Further studies are needed to establish the mode of activity. The Anthelmintic activity can be ascertained by testing the drug on other species of helminthes which is our future part of research work.

Table 1: Anthelmintic Activity of Methanolic Extract of Leaves *Picrorrhiza kurroa*

Treatment	Concentration used (mg/ml)	Time taken for paralysis (min) X ± S.D	Time taken for death (min) X ± S.D
Control	-	-	-
Standard (Piperazine citrate)	10 mg / ml	17 ± 1.571*	39 ± 1.932*
Methanolic extract of *Picrorrhiza kurroa*	20 mg / ml	76 ± 3.303*	99.33 ± 0.402*
	41 mg / ml	65.33 ± 2.883**	90.67 ± 3.921**
	60 mg / ml	56 ± 2.017**	85.00 ± 5.310**
	80 mg / ml	48.33 ± 1.498**	69.83 ± 2.496**
	100 mg / ml	48.33 ± 1.498**	51.67 ± 2.108**
	120 mg / ml	27.33 ± 2.060**	40.33 ± 0.9888***

All values are mean ± SEM and analyzed by one way ANOVA followed by Dunnett's test n = 5, *p < 0.05, **p < 0.01, ***p < 0.001

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