

ANTHELMINTIC ACTIVITY OF THE WHOLE PLANT OF BAUHINIA PURPUREA (Linn.)

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ABSTRACT

Aqueous and Ethanolic extracts from the whole plant of *Bauhinia purpurea* were investigated for their anthelmintic activity against *Pheretima posthuma*. Three concentrations (25, 50 and 100 mg/ml) of each extracts were studied in activity, which involved the determination of time of paralysis and time of death of the worm. Both the extracts exhibited significant anthelmintic activity at highest concentration of 100 mg/ml. Piperazine citrate in same concentration as that of extract was included as standard reference and normal saline water as control. The anthelmintic activity of aqueous and ethanolic extracts of *Bauhinia purpurea* has therefore been demonstrated for the first time.

Keywords: *Bauhinia purpurea*, Anthelmintic activity, *Pheretima posthuma*, Piperazine citrate.

INTRODUCTION

Helminthiasis, or worm infestation, is one of the most prevalent disease and one of the most serious public health problems in the world. Hundreds of millions if not billions of human infections by helminthes exist worldwide and increased world travel and immigration from the developing countries¹. 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 helminths^{2,3} against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity.

Bauhinia purpurea linn. (Fam. Fabaceae)⁴ is a flowering plant native to South China and southeastern Asia. In the United States of America, the tree grows in Hawaii, coastal California, southern Texas and southwest Florida. Common names include Hong Kong Orchid Tree, Purple camel's foot, and Hawaiian orchid tree. It is a small to medium-sized deciduous tree growing to 17 m tall^{5,6}. The investigation of chemical constituents of plants of the Fabaceae family has aroused considerable attention on account of the antitumor activities found in dibenzoxepins named bauginiastatins 1-4 triterpenes isolated from *B. purpurea*⁷.

In previous papers we described the chemical constitution of the isolated two new dimeric flavonoids from 70% aq. Acetone extract of *B. purpurea* leaves and phytol fatty esters, lutein, and β -sitosterol with Antifungal activity⁸. α -Amyrin Caprylate was isolated from ethanolic extract of leaf of *B. purpurea*⁹. The ethanolic extract of leaf of *B. purpurea* showed antioxidant activity¹⁰. Present work was undertaken to evaluate traditional anthelmintic property of the whole plant of *B. purpurea*.

MATERIAL AND METHODS

Plant material

The plant specimens for the proposed study were collected from Bhilai, Chhattisgarh, India during July 2010 and its botanical identity was confirmed by Dr. S. Panda, Associate Professor, Department of Botany, Govt. Art & Science College Durg, Chhattisgarh. A Voucher specimen was deposited in Department of Botany, Govt. Art & Science College Durg, Chhattisgarh.

Preparation of Extract

The whole plant of *B. purpurea* were shade dried, crushed to produce coarse powder and subjected to extraction in Soxhlet extractor using ethanol (95%). The extract was filtered while hot and concentrated by vacuum which is further evaporated to dryness to obtain alcoholic extract and stored at 4°C until used. Aqueous extract were obtained by maceration for 24 hours. The extract was double filtered by using muslin cloth and Whatman no.1 filter paper and concentrated by evaporation on water bath.

Animals

Indian adult earthworms *Pheretima posthuma* collected from moist soil and washed with normal saline to remove all fecal matter were used for the anthelmintic study. The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all experimental protocol due to its anatomical and physiological resemblance with intestinal roundworms parasite of human beings¹¹.

Drugs and Chemicals

The following drugs and chemicals were used. Drugs: Piperazine citrate (Glaxo Smithkline) Chemicals: ethanol A.R. (PCL, Pune), and saline water (Claris Life Sciences Ltd., Ahmednagar).

Anthelmintic Activity

Aqueous and ethanolic extracts from the whole plant of *B. purpurea* were investigated for their anthelmintic activity against *Pheretima posthuma*. Various concentrations (20, 50 and 100 mg/ml) of each extract were tested in the bioassay, which involved determination of time of paralysis and time of death of the worms. Piperazine citrate was included as standard reference and saline water as control. The anthelmintic assay was carried as per the method of¹² with minor modifications.

The assay was performed on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings^{13,14}. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro^{15,16}. In the first set of experiment, six groups of six earthworms were released in to 50 ml of solutions of piperazine citrate, aqueous and ethanolic extracts of whole plant of *B. purpurea* (25, 50 and 100 mg/ml each) in distilled water. All drug and extract solutions were freshly prepared before starting the experiment.

Piperazine citrate was used as reference standard while saline water as control. Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms lost their motility followed with fading away of their body colors.

RESULTS AND DISCUSSION

Data in the Table 1 reveals that aqueous and ethanolic extracts of *B. purpurea* showed significant anthelmintic activity at all the concentrations. The ethanolic extract showed more significant effect on paralyzing the worms, in terms of paralysis time, at every concentration compared to that of aqueous extract when compare with standard.

Table 1: Anthelmintic activity of aqueous and ethanolic extracts of whole plant of *b. purpurea* linn.

Treatment	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Control (Normal Saline)	-	-	-
Piperazine (Standard)	25	27±0.4	33±0.8
	50	20±0.9	28±0.4
	100	13±0.5	20±0.4
Aqueous extract	25	65± 0.8	96± 0.1
	50	45±0.1	59±0.6
	100	32±0.2	45±0.4
Ethanolic extract	25	50±0.2	64±0.5
	50	36±0.6	49±0.3
	100	30±0.6	44±0.4

All Values represent Mean± SD; n=6 in each group. Comparisons made between standard versus treated groups

CONCLUSION

It could be concluded and confirmed that the aqueous and ethanolic extracts of whole plant of *B. Purpurea* has anthelmintic activity comparable with standard drugs, which is effective against parasitic infections of humans. Further, in future it is necessary to identify and isolate the possible active phytoconstituents responsible for the anthelmintic activity and study its pharmacological actions.

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