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Investigation of *in-vitro* anthelmintic activity of B*auhinia racemosa linn*.

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ABSTRACT

Helminth infections are the most common health problems in India, in developing countries they pose a large treat to public. These infections can affect most population in endemic areas with major economic and social consequences. The plant *Bauhinia Racemosa* Linn. is a species of flowering plant belongs to Fabaceae family. The different parts of plant being traditionally used in catarrh, infection of children, boil, glandular and swelling. The present study was undertaken to evaluate anthelmintic activity of different extracts of whole plant of *Bauhinia Racemosa* Linn. The different successive extracts namely petroleum ether, ethanol and aqueous using an adult Indian earthworms, *Pheretima posthuma* as a test worm. Three concentrations (50, 75 and 100 mg/ml) of each extracts were studied in the bioassay which involved the determination of time of paralysis and time of death of the worm. Albenzadole in same concentration as that of extract was included as standard reference and normal saline water as control. The results of present study indicate that the crude ethanolic extract significantly demonstrated paralysis and also caused death of worm in dose dependent manner, while aqueous and petroleum extracts show weak anthelmintic effect. Further studies are in process to isolate the active principles responsible for the activity.

Key words: *Bauhinia Racemosa , Anthelmintic activity, Pheretima Posthuma, Albenzadole.*

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 countries (Williams *et al.* 2002). 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 (Geert & Dorny 1995; Coles 1997) against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity. The plant Bauhinia racemosa Lam belongs to the family,Caesalpiniaceae popularly known as Sittacha (Tamil)has a widespread occurrence in India, Ceylon, China,and Timor. It is used in traditional medicine for the treatment of various ailments. The stem bark of the plant is an astringent and is used in the treatment of headache, fever, skin diseases, tumors, diseases of the blood, dysentery and diarrhea(Kirtikar. B, *et al* 1975). Pharmacological studies of the plant revealed that the ethanol extract of leaves of B racemosa presented analgesic, antipyretic, anti- inflammatory, antispasmodic , and antimicrobial activity(Ali MS *et al*, 1999). The fresh flower buds of this plant showed antiulcer activity(Akhtar AH, 1995). Cytotoxicity against CA-9 KB in cell culture, hypotensive, and hypothermic activities were also reported from the hydroalcholic extract of B.Racemosa.(Dhar ML *et al*, 1968) Several phytochemical constituent of B.Racemosa have been isolated and chiefly include flavonoids (kaempferol and quercetin), coumarins (scopoletin and scopolin) (Prakash A *et al*, 1976), triter-penoids (β-amyrin), steroids (β-sitosterol)(El-Hossary GA *et al*, 2000), and stilbenes (resveratrol)(Anjaneyulu ASR *et al*, 1984). Plant derived natural products such as flavonoids,terpenoids, and steroids etc have received considerable attention in recent years due to their diverse pharmacological properties including

antioxidant and antitumor activity (DeFeudis et al, 2003, Takeoka GR *et al*, 2003). Present work was undertaken to evaluate traditional anthelmintic property of the whole plant of *B. Racemosa.*

MATERIAL AND METHODS

Plant material

The plant specimens for the proposed study were collected and authenticated from Government Ayurvedic College, Raipur.

Preparation of Extract

The whole plant of *B. Racemosa* were shade dried, crushed to produce coarse powder and subjected to successively extraction in Soxhlet extractor using solvent like petroleum ether (60- 80°C) and ethanol (95%) based on their polarity. Finally the extracts were concentrated by vacuum which is further evaporated to dryness to obtain crude extracts and stored at 4º 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 form moist soil and washed with normal saline to remove all fecal matter were used for the anthelmintic study. The earthworms of 4-6 cm in length and 0.3-0.4 cm in width were used for all experimental protocol due to its anatomical and physiological resemblance with intestinal roundworms parasite of human beings (Vigar 1984).

Drugs and Chemicals:

The following drugs and chemicals were used. Drugs: Albenzadole (Glaxo Smithkline) Chemicals: ethanol A.R. (PCL, Pune), petroleum ether (60- 80°C) (PCL, Pune) and saline water (Claris Life Sciences Ltd., Ahmednagar).

Anthelmintic Activity

Aqueous, ethanolic and petroleum ether extracts from the whole plant of *B. Racemosa* were investigated for their anthelmintic activity against Pheretima posthuma. Various concentrations (50, 75 and 100 mg/ml) of each extracts were tested in the bioassay, which involved determination of time of paralysis and time of death of the worms. Albenzadole was included as standard reference and saline water as control. The anthelmintic assay was carried as per the method of (Ajaiyeoba *et al*. 2001) 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 (Sollmann 1918; Vidyarthi 1967; Thorn *et al*.1988). Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro (Jain *et al*.1972; Martin 1997; Suresh *et al*.2002)**.** In the first set of experiment, six groups of six earthworms were released in to 25 ml of solutions of Albenzadole, aqueous, ethanolic and petroleum ether extracts of whole plant of *B. Racemosa* in distilled water. The remaining groups were treated for different concentrations. All drug and extract solutions were freshly prepared before starting the experiment. Albenzadole 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 petroleum ether extracts of *B. Racemosa* showed moderate 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 and petroleum ether extracts when compare with standard.

Table 1: Anthelmintic activity of aqueous, ethanolic and petroleum ether extracts of whole plant of *B. Racemosa linn.*

Treatment	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Control (Normal Saline)	-	-	-
Albenzadole (Standard)	50	24±0.4	28±0.8
	75	17±0.9	24±0.4
	100	13±0.5	22±0.4
Aqueous extract	50	52±0.2	66±0.5
	75	41±0.6	59±0.3
	100	37±0.6	50±0.3
Ethanolic extract	50	36±0.6	40±0.4
	75	31±0.8	30±0.3
	100	24±0.1	27±0.1
Petroleum ether extract	50	58± 0.8	85± 0.1
	75	45±0.1	55±0.6
	100	42±0.2	50±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, ethanolic and petroleum ether extracts of whole plant of *B. Racemosa* have anthelmintic activity on dose dependent manner when 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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