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Evaluation of Anthelmintic activity of *Bahunia Purpurea* L. Flower in different solvent extract

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Abstract

Bahunia purpurea Lin belong to the family fabaceae. The present research was conducted to investigate the Anthelmintic activity of different extract of flowers of *Bahunia*. Preliminary phytochemical investigation were performed by chemical tests. The Anthelmintic activity was conducted by worm collection and authentication and Anthelmintic assay. In the preliminary phytochemical test, the leaves extract showed the presence of phytosterols, alkaloids, glycosides, flavonoids, saponins, tannins, and phenolic compounds. Ethyl acetate and methanolic extracts of *Bahunia purpurea* linn showed significant action.

Keywords: Phytochemical screening, medicinal plant, *Bahunia purpurea* L. flower.

Introduction

Kovidara is a Sanskrit ayurvedic name of a medicinal tree botanically equated to *Bahunia purpurea* linn belongs to the family fabaceae. It is a medium sized evergreen ornamental tree, found throughout India ascending up to an altitude of 1300 meters in the sub- himalya tract sparingly throughout India and china often cultivated and also planted among avenues for shade and ornamental purpose. The flowers, root and bark of the *Bahunia purpurea* linn tree have been used in ayurvedic medicinal formulation since time immemorial and has been mentioned in Ayurvedic classical text. It also forms a part of folk and traditional community health practices in certain part of Karnataka and India. Ayurvedic preparation also prescribe it's use as one of the ingredients for intrinsic hemorrhage, snake poisoning etc. The flower of the tree have got medicinal use both in Ayurveda and in traditional system. Hence there is a necessity to develop standardization identification parameters to aid quality control and to avoid adulteration with special focus on flower. The botanical identification study have been reported earlier, phytochemicals finger printing has not been carried out till now. Hence the study is aim attempt to develop and report comprehensive authentication parameters including macroscopical, microscopical physio- chemical profile of the flower of *Bahunia purpurea* linn.

Taxonomical classification of *Bahunia purpurea* linn

| | |
|------------------------------|-------------------------|
| Clade | Tracheophyte |
| Division | Angiosperms |
| Order | Fabales |
| Family | Fabaceae |
| Genus | Bahunia |
| Species | B. purpurea |
| Description: Botanical name: | <i>Bahunia purpurea</i> |
| Kingdom | Plantae |

Common name: Purple bahunia, orchid tree, camel's foot tree, butterfly tree

Hind: Kota, raktakanchan, khairwal, karar, kanchan

Malay: Tapak kuda

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Nepali: Tanki

Spanish: Pie de cabra

Thai: Sieowaan, sieo dok daeng

Trade name: Kachan, karar, khairwal

Material and Method

Collection and identification of plant

Plant *Bauhinia purpurea* species of flowering plant in the family fabaceae. was collected from sub forest office Shahapur during the month of Sept – Feb. The flowers were dried under shade away from direct sunlight. The dried

flowers were cleaned and coarsely powdered in grinder and powder materials was passed through mesh 120 mesh to remove fine powdered and coarse powder was used for extraction.

Pharmacognostic Investigation of *Bauhinia purpurea* Organoleptic/Macroscopic evaluation

Colour: Purple

Odour: Scent odour

Taste: Fragrant

Texture: Coarse



Fig 1: *Bauhinia purpurea* tree



Fig 2: *Bauhinia purpurea* Flower



Fig 3: *Bauhinia purpurea* leaf



Fig 4: *Bauhinia purpurea* seeds

Standardization of *Bauhinia purpurea* L.

The evaluation of crud drug involves the determination of identity, purity and quality. Purity depends upon the absence of foreign matter whether organic or inorganic. The following standardization parameter were evaluated to obtain the qualitative information about purity and quality of *Bauhinia purpurea*. The result are shown in table ^[1].

Determination of foreign organic matter

Five gm of air dried coarsely powdered drug was spread in thin layer. The sample was inspected with the unaided eye or with the use of 6X lens. The foreign matter was separated manually as completely as possible. Sample was weighed and percentage of foreign organic matter was determined from the weight of the drug taken (Indian pharmacopeia 1996).

Determination of moisture content

Accurately weighed glass stoppered, swallow weighing bottle and dried 2 gm of sample was transferred to the bottle

and cover, the weight was taken and sample was distributed evenly and poured to a depth not exceeding 10mm then loaded was kept in the oven and stopper was removed. The sample was dried to constant weight. after drying it was collected to a room temperature in a desicator weigh and calculated loss on drying in terms of percentage (w/w) (Indian pharmacopeia 1996).

Determination of Physical evaluation

Determination of total ash value

Determination of the residue remains after incineration. Ash value used to determine quality and purity of crude drug. Ash value contains inorganic radicals like phosphates carbonates and silicates of sodium, potassium, magnesium, calcium etc. sometimes inorganic variables like calcium oxalates, silica and carbonate content of the crude drug affects total ash value. Such variable are the removed by treating with acid and then acid insoluble ash value is determined.

1. Determination of total ash value

Accurately weighed about 3gm of air dried powdered drug was taken in a tared silica crucible and incinerated by gradually increasing the temperature to make it dull red hot until free from carbon. Cooled and weighed, repeated for constant value. Then the percentage of the total ash was calculated with reference to the air dried drug.

2. Determination of acid insoluble ash value

The ash obtained as dried under total ash was boiled with 25ml of 2N HCl for 5 minutes. The insoluble matter was collected on an ash less filter paper, washed with hot water ignited and weighed, then calculated the percentage of acid insoluble ash with reference to the air dried drug

3. Determination of water soluble ash value

The total ash obtained was boiled with 25ml of water for 5 minutes. The insoluble matter was collected on an ash less filter paper, wash with hot water and ignited for 15 minutes at a temperature not exceeding 450 degree Celsius The of water insoluble matter was subtracted from the weight of total ash. The difference in weight represents the water soluble ash. The percentage of water soluble ash was calculated with reference to the air dried drug.

Determination of extractive Values

1. Determination of alcohol soluble extractive value

5 gm of the air - dried coarse powder of the plant material was macerated with 100 ml of 90% ethanol in a closed flask for 24 hours, shaking frequently during the first 6 hours and allowing to stand for 18 hours. Thereafter, it was filtered rapidly taking precautions against loss of the solvent. Out of that filtrate, 25 ml of the filtrate was evaporated to dryness in a tared flat bottomed shallow dish, dried at 105 °C and weighed. The percentage of ethanol soluble extractive value was calculated with reference to the air - dried drug.

2. Determination of water soluble extractive value

Weigh accurately the 5 gm of coarsely powdered drug and macerate it with 100 ml of chloroform water in a closed flask for 24 hours, shaking frequently during the first 6 hours and allowing to stand for 18 hours. Thereafter, it was filtered rapidly taking precautions against loss of the solvent. Then 25 ml of the filtrate was evaporated to dryness in a tared flat bottomed shallow dish, dried at 105 °C and weighed. The percentage of water soluble extractive was calculated with reference to the air dried drug

Material and Methods

Collection and identification of plant

Bauhinia purpurea Linn is a species of flowering plant in the family fabaceae.

Were collected from sub forest office Shahapur during the month of Sept – Feb.

The flowers were dried under shade away from direct sunlight. The dried flowers were cleaned and coarsely powdered in grinder and powder materials was passed through mesh 120 mesh to remove fine powdered and coarse powder was used for extraction

Preparation of Plant extract

The powdered flower material of *Bauhinia purpurea* linn was subjected to successive solvent extraction with Methanol.

10gm of powdered flower material was subjected to soxhlet extraction for about 10 hours with 250 ml of the Methanol solvent. The extracts obtained were later kept for distillation to remove the excessive solvent. These extracts were mixed and dried. The aqueous extract was fractioned by using different solvents like ethyl acetate and hexane and these extracts were stored in a cool and dry place.

Table 1: Preliminary phytochemical screening of extracts

| Test | Aqueous extract | Methanolic extract |
|--------------------------------------|-----------------|--------------------|
| Test for Alkaloids | ++ | ++ |
| Test for amino acid & proteins | + | + |
| Test for carbohydrates | +++ | ++ |
| Test for flavonoid | +++ | +++ |
| Test for saponin | ++ | + |
| Test for glycoside | +++ | ++ |
| Test for steroid & sterol | +++ | +++ |
| Test for terpenoids | + | ++ |
| Test for tannins & phenolic compound | +++ | +++ |
| Test for volatile oil | +++ | ++ |

"+ Slight changes, ++ moderate, +++ stronger reactions,"

Pharmacological study

The extracts of flower of *Bauhinia purpurea* linn exhibits moderate to significant anthelmintic activity at the dose of 50-250 µg/ml. The results of phytochemical analysis were shown in Table

All the extracts were tested for anthelmintic activity, piperazine citrate was employed as reference standard. It has been observed that all the tested extracts showed mild to moderate anthelmintic activity. Extracts of flower of *Bauhinia purpurea* linn was found to be most active agents among the extracts. Also aqueous extract of flower of *Bauhinia purpurea* linn was showing good anthelmintic activity.

1. Worm collection and authentication

Indian earth worm *pheretima posthuma* (Annelida) were collected from the water logged areas of soil, the average size of earth worm being 6-8cm. They were washed with tap water for the removal of adhering dirt. The anthelmintic activity was evaluated on adult Indian earthworm *Pheretima posthuma* (Annelida). It resembles anatomically and physiologically with the intestinal round worm parasite of human being. Indian earthworms.

Anthelmintic Assay

Five groups of approximately equal size Indian earthworms consisting of six earthworms in each group were released in 10 ml of desired formulation. Each group was treated with one of the following: Vehicle (1% gum acacia in normal saline). Piperazine citrate (30 mg/ml), methanolic extract (50, 60, 70, 80, 90 & 100 mg/ml) and aqueous extract (10, 30, 50, 70 90 & 100 mg/ml) in normal saline containing 1% gum acacia. Observations were made for the paralysis time (PT) and subsequently for death time (DT). The time of paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50 °C).

Table 2: Anthelmintic activities of *Bauhinia purpurea*.L.

| S. No | Extract | Time taken for paralysis min) μg | | | | Time taken for death (min) | | | |
|-------|--------------------|---|-----------------|-----------------|------------------|----------------------------------|-------------------|------------------|-----------------|
| | | Dose ($\mu\text{g}/\text{ml}$) | | | | Dose ($\mu\text{g}/\text{ml}$) | | | |
| | | 50 | 75 | 125 | 250 | 50 | 75 | 125 | 250 |
| 1 | AQE | 4.66 \pm 0.81 | 3.3 \pm 1.03 | 2.5 \pm 0.54 | 0.52 \pm 0.34 | 65 \pm 0.89 | 57.5 \pm 1.04 | 42.5 \pm 1.64 | 14 \pm 0.89 |
| 2 | MeOH E | 3.5 \pm 1.04 | 3.0 \pm 0.63 | 2.33 \pm 516 | 1.02 \pm 1.75 | 60.83 \pm 075 | 52.33 \pm 0.816 | 37 \pm 1.41 | 9.51 \pm 0.83 |
| 3 | EtOAcE | 4.88 \pm 0.75 | 2.5 \pm 0.54 | 2.6 \pm 1.03 | 0.49 \pm 0.27 | 58.33 \pm 0.81 | 53.55 \pm 0.75 | 28.66 \pm 1.03 | 7.33 \pm 1.03 |
| 4 | Hex E | 5.8 \pm 0.75 | 2.66 \pm 0.16 | 2.33 \pm 0.16 | 0.82 \pm 0.816 | 62.5 \pm 1.04 | 59.6 \pm 1.21 | 50.66 \pm 0.86 | 47 \pm 0.89 |
| 5 | Piperazine citrate | 3.55 \pm 0.56 | 2.1 \pm 0.59 | 1.9 \pm 0.48 | 0.32 \pm 1.03 | 48.2 \pm 0.59 | 50.05 \pm 1.08 | 24.55 \pm .52 | 5.22 \pm 1.1 |

Conclusion

Bauhinia purpurea linn is a plant that has shown potential as a source of chemotherapeutic compounds. The present study, therefore investigate the phytochemical constituents of extracts of flower of *Bauhinia purpurea* linn by extraction. The results obtained in the present study clearly indicate that the both aqueous and methanolic extract of *Bauhinia purpurea* linn are having potent phytochemicals. From the investigational reports indicate that the anti-helmintic activity of ethyl acetate and methanolic extracts of *Bauhinia purpurea* linn showed significant action towards Indian earth worms. Further research is needed to fractionate the ethylacetate, methanolic extracts and isolate the molecule (s) responsible for biological activity.

Results and Discussion

Methanolic and aqueous extract of flowers of *Bahunia purpurea* Linn was screened foe Anthelmintic activity. *Pheretima posthma* worms are easily available and used as a suitable model foe screening anthelmintic activity. Piperazine citrate was used as reference standard with distilled water as a vehicle control. The mean and SEM were analysed followed by ANNOVA by Dunnett's test, $p < 0.05$ being considered as significant.

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