



**PHYTOCHEMICAL SCREENING AND *IN VITRO* ANTHELMINTIC ACTIVITY OF
FLOWERS OF BAUHINIA TOMENTOSA**

Varalakshmi L. *, Sarika Reddy K., Sangeetha A., Sruthi A., Naganjaneyulu R., Anil Kumar A. and
Thatikayla Mahender

Avanthi Institute of Pharmaceutical Sciences, Approved By AICTE, PCI, NAAC, JNTUH, Gunthapally, Hayath Nagar,
Hyderabad -501512.



*Corresponding Author: Varalakshmi L.

Avanthi Institute of Pharmaceutical Sciences, Approved By AICTE, PCI, NAAC, JNTUH, Gunthapally, Hayath Nagar,
Hyderabad -501512.

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ABSTRACT

Medicinal plants have different chemical constituents such as flavonoids, glycosides, alkaloids, tannins, proteins, etc. which are responsible for different biological activities. Because of less cost, easy availability, more active with less side effects, plants are used to treat various diseases. The aim of the present study was to evaluate the *invitro* anthelmintic activity of ethyl acetate and methanol extract of flowers of *Bauhinia tomentosa* Linn using *Pheretima posthuma* as test worms. The time of paralysis and time of death were studied and the activity was compared with albendazole as reference standard. Ethyl acetate and methanol extract of flowers of *Bauhinia tomentosa* Linn shows significant *in vitro* anthelmintic activity as evidenced by decreased paralyzing time and death time. The results thus support the use of *Bauhinia tomentosa* as an anthelmintic agent.

KEYWORDS: *Bauhinia tomentosa*, Albendazole, *Pheretima posthuma*, Anthelmintic activity.

INTRODUCTION

Medicinal Plants Have Different Chemical Constituents Which Are Used To Treat Many Diseases, Hence People. Some people value these plants due to the ancient belief which says plants are created to supply man with food, medical treatment, and other effects. It is thought that about 80% of the 5.2 billion people of the world live in the less developed countries and the World Health Organization estimates that about 80% of these people rely almost exclusively on traditional medicine for their primary healthcare needs. Medicinal plants are the "backbone" of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize medicinal plants on a regular basis.^[1]

Herbs had been priced for their medicinal, flavoring and aromatic qualities for centuries. Traditional system of medicine continues to be widely practiced as many accounts. Population arise, inadequate supply of drugs, prohibitive cost of treatment, side effects of several other type of drugs have led to increased emphasis on the use of plant materials as a source of medicine for a wide variety of human ailments.

Parasitic infection including helminthiasis is a critical serious problem in the tropical regions including the Asian and African countries which affects more than 2.5

billion of people worldwide.^[2] Different type of helminths infects the human and animals, of which intestinal roundworms *Pheretima posthuma* (Annelida) are most common. Variety of several clinical symptoms arises due to this infection includes dysentery, diarrhea, nausea, vomiting, loss of appetite, loss of weight, acidity, and anemia. Other signs and symptoms of helminthic infections include respiratory symptoms, dermatological consequences, and epilepsy as a result of neurocysticercosis. Helminthic infections may also subvert immune responses to pathogens of other diseases such as tuberculosis, HIV, and malaria.^[3]

Herbal plants contain and produce a variety of chemical substances used as a remedy for treating diseases. Helminthiasis has been treated with some medicinal plants or their extract based on the folklore medicine. *Bauhinia tomentosa* (Linn.) flower was selected for anthelmintic activity based on its availability, High therapeutic value, Activity has not been scientifically investigated.

MATERIALS AND METHODS

Plant used: The *Bauhinia tomentosa*, family Caesalpiniaceae flowers was collected from Yadadri dist, Telangana, India. The collected plant was identified and authenticated and Subjected to extraction.^[4]

Preparation of extract

The collected *Bauhinia tomentosa* flower was dried under shade for 3 days and then made into a coarse powder with a mechanical grinder for further use. Extracted with solvents (petroleum ether, Ethyl acetate, Methanol). All solvents were distilled before use.

Petroleum ether extraction

The dried material (100gm) was first extracted with petroleum ether (60-80°C) for defatting purpose, in a Soxhlet apparatus (continuous hot percolation process) and after complete extraction (till color disappears (12hrs). extract was concentrated by distillation for removal of the solvent. The concentrated solution was evaporated to dryness. The yield of pet ether extract was calculated.

Ethyl acetate extraction: After the extraction with Petroleum ether, plant material was dried and again extracted with Ethyl Acetate in soxhlet apparatus and after complete extraction (20 hrs), the extract was concentrated by distillation for removal of the solvent. The concentrated solution was evaporated to dryness. The yield of ethyl acetate extract was calculated.

Methanol extraction

After the extraction with ethyl acetate the mark was dried and again extracted with methanol in soxhlet apparatus and after complete extraction (42hrs), extract was concentrated by distillation for removal of the solvent, The concentrated solution was evaporated to dryness. Percentage yield of three extracts were calculated and reported in (Table no: 1).

Ethyl acetate extract and methonolic extract are subjected to Preliminary Phytochemical Evaluation.^[5]

RESULTS AND DISCUSSION**Table No. 1: Data for Percentage Yield of Three Extracts of Bauhinia Tomentosa (Linn.)**

S No.	Type Of Extracts	Practical Yield (In Grams)	Percentage Yield (W/W)
1.	Petroleum Ether Extract	5.4gms	3.4%
2	Ethyl Acetate Extract	6.6gms	4.2 %
3	Methanol Extract	10.2gms	8.6%

Table No. 2: Qualitative phytochemical analysis of three extracts.

S. No	Tests	Pet. ether extract	Ethyl acetate extract	Methanol extract
1	Carbohydrates	-	+	-
2	Glycosides	-	-	-
3	Proteins and Amino acids	-	-	-
4	Fixed oils & fats	+	-	-
5	Gums and mucilage	-	-	-
6	Alkaloids	-	+	+
7	Phytosterols	-	-	+
8	Flavonoids	-	+	+
9	Phenolic compounds	-	+	+
10	Saponins	-	-	+
11	Tannins	-	-	-

Test Parasites Used For Study Was Pheritema Postuma, Family Megascolecidae Commonly Known As Indian Earthworm. Numbers Of Studies Has Used Pheritema Postuma As Model Parasite To Evaluate In-Vitro Anthelmintic Activity.^[6-8]

Indian Adult Earthworms (Pheretima Posthuma) Were Used To Carry Out The Experiment. The Earthworms Were Collected. Worms Were Washed With Normal Saline To Remove All Faecal Matter. The Earthworms Of 8-10 Cm In Length And 0.3-0.4 Cm In Width Were Used For All The Experimental Protocol. Ready Availability, Anatomical And Physiological Resemblance Of Pheretima Posthuma Made It To Be Used Initially For In-Vitro Evaluation Of Anthelmintic Activity.

Experimental Design

The Indian earthworm (Pheretima posthuma) of nearly equal size, six in each group was taken for the experiment. Each type of dried extract was suspended in 1% w/v Carboxy-Methyl Cellulose (CMC), prepared in normal saline water in three different conc. (25, 50, 100 mg/ml). Albendazole suspension of same conc. was prepared and it was taken as standard. The normal saline water with 1% CMC was taken as a control. The Earthworms were placed in Petridish containing 15 ml of solution of *Bauhinia tomentosa* extract. The time for paralysis was noted by observing the movements of Pheretima posthuma, the vigorous moment or motility of Pheretima posthuma taken as paralysis and no moment or motility of Pheretima posthuma taken as death and white secretions and fading away of their body color^[9-10] (Table 3)

(+) - indicates presence (-) - indicates absence

Table no. 4: *In vitro* anthelmintic activity of flowers of *bauhinia tomentosa*.

Groups/ Treatment	Concentration (mg/ml)	Time(min)	
		Paralysis	Death
Control (1%CMC in normal saline)	1	Paralysis not observed	Death not observed
Albendazole (Std)	25	10.23±0.22	25.78±0.34
	50	7.20±0.44	18.32±0.46
	100	5.26±0.67	10.56±0.82
Ethyl acetate extract	25	35.76±0.44	75.13±0.14
	50	27.12±0.15	64.76±0.25
	100	20.08±0.23	50.18±0.66
Methanolic extract	25	25.16±0.34	45.19±0.67
	50	20.18±0.45	36.18±0.22
	100	10.46±0.33	28.33±0.18

DISCUSSION

Bauhinia tomentosa (Linn.) belongs to family-Caesalpinaceae. Flowers were collected, dried and extracted with organic solvents. The percentage yield of petroleum ether, ethyl acetate and methanol extract was obtained 3.4%, 4.2% & 8.6% w/w. respectively.(table-1).

Preliminary phytochemical screening of crude extract of the flowers of the *bauhinia tomentosa* Revealed the presence of steroids, Alkaloids, flavonoids, saponin, phenolic compounds etc. Alcoholic (Methanolic) extract exhibit more phyto-constituents than ethyl acetate extract (Table-2).

Standard drug used is albendazole, paralysis and death time of Ethyl acetate and methanolic extract is compared with albendazole as standard drug(paralysis time: 5.26±0.07 Min and death time: 10.56±0.82min, The anthelmintic activity exhibited by the methanol extract at highest concentration (100mg/ml) which takes 28.33±0.18minutes 10.46±0.33minutes for paralysis and for death of the worms, followed by ethyl acetate crude extract which includes 20.08±0.23minutes for paralysis and 50.18±0.66minutes for death of the worms. Ethyl acetate extract exhibit less activity in comparison to alcoholic extract and standard drug at all the tested doses. Potency of the extract was inversely proportional to the time for paralysis and death of the worms. The crude extracts of the flowers of the *Bauhinia tomentosa* produced a significant anthelmintic activity on *Pheretima posthuma* in dose dependent manner as shown in (Table no-3).

SUMMARY

- ❖ The *Bauhinia tomentosa* (Linn.) flower, Family Caesalpinaceae has been observed for its phytochemical investigation and *in-vitro* Pharmacological evaluation.
- ❖ The phytochemical investigation of Methanolic Extract of *Bauhinia tomentosa* (Linn.) flower showed the presence of flavonoids, saponins, Alkaloids, Phytosterols, phenolic compounds were identified. The crude extracts of the flowers of the

bauhinia tomentosa produced a significant anthelmintic activity(*in vitro*) on *Pheretima posthuma* in a dose dependent manner.

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