



## A STUDY ON EVALUATION OF ANTHELMINTIC ACTIVITY OF BAUHINIA VARIEGATA

Lakshmi V.V.\*, Archana Akhileswaran, Aysha Binsy P., Greeshma Sreenivas, Nafih T. and Sudheesh P.S.

\*Department of Pharmaceutical Chemistry, Prime College of Pharmacy, Erattayal, Palakad, Kerala- 678551.

\*Corresponding Author: Lakshmi V.V.

Assistant Professor, Department of Pharmaceutical Chemistry, Prime College of Pharmacy, Erattayal, Palakad, Kerala- 678551.

Article Received on 06/04/2022

Article Revised on 27/04/2022

Article Accepted on 17/05/2022

### ABSTRACT

The aim of present study was to evaluate anthelmintic activity of, ethanolic extracts of aerial parts of *Bauhinia variegata* using earthworms. Various concentrations i.e.50, 100, and 200mg/ml of above mentioned extract were tested in bioassay which involves determination of time of paralysis (P) and time of death (D) worms. Albendazole of same concentration was included as standard reference of normal saline solution as control. The results of present study indicated that the ethanolic extracts of *Bauhinia variegata* shows significantly Anthelmintic activity when compared to the reference Albendazole drug. In conclusion the traditional use of leaves of plant *Bauhinia variegata* as an anthelmintic have been confirmed.

**KEYWORDS:** Anthelmintic, *Bauhinia variegata*, *Pheretima pothuma*, Albendazole.

### INTRODUCTION

Anthelmintics are drugs that are used to treat infections with parasitic worms. This includes both flat worms, e.g., flukes and tapeworms and round worms, i.e., nematodes. They are of huge importance for human topical medicine and for veterinary medicine. The World Health Organization estimates that a staggering 2 billion people harbour parasitic worm infections. Parasitic worms also infect livestock and crops, affecting food production with a resultant economic impact. Also of importance is the infection of domestic pets. Indeed, the companion animal market is a major economic consideration for animal health companies undertaking drug discovery programmes.<sup>[1]</sup> Despite the prevalence of parasitic worms, anthelmintic drug discovery is the poor relation of the pharmaceutical industry. The simple reason is that the nations which suffer most from these tropical diseases have little money to invest in drug discovery or therapy. It comes as no surprise therefore that the drugs available for human treatment were first developed as veterinary medicines.<sup>[2]</sup> In the treatment of parasitic disease, the anthelmintic drugs are used indiscriminately. Recently the use of anthelmintic produces toxicity in human beings. Hence the development and discovery of new substances acting as anthelmintics are being derived through plants which are considered to be the best source of bioactive substances. Various plants were used in venereal diseases, to promote healing of wounds, swelling, abscesses, rheumatism and treating pain in lower extremities, skin disease, leucorrhoea, dysentery,

dysuria and fever. Anthelmintics are those drugs that are used in expelling out of worms that are parasitic in nature by either stunning them or by killing them. They are also known as vermifuges or vermicides. In other word, anthelmintics are drugs that are used for the treatment of infections caused by worms, flukes, nematodes, round worms, tapeworms etc.<sup>[3]</sup> (Piyush Yadav et al; 2011). Helminth infections are among the most widespread infections in humans, distressing a huge population of the world. Although the majority of the infections due helminth are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of undernourishment, anaemia, eosinophilia, and pneumonia. Parasitic diseases cause ruthlessness morbidity affecting principally population in endemic area areas. The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes disease. Hence there is an increasing demand towards natural anthelmintics<sup>[4]</sup> (Satish. B. Kosalge et al: 2009).

### MATERIAL AND METHOD

#### Plant Material Collection

Aerial parts of *bauhinia variegata* was collected from surrounding areas of Palakkad district, Kerala during the month of July 2017 and was identified and authenticated by the botanist Mrs. Maya. C.Nair Department of Botany, Victoria college Palakkad and a voucher specimen was preserved for future reference.

### Experimental Animals

Indian adult earthworms (*Pheretima posthuma*) collected from moist soil near to college campus and washed them with normal saline to remove soil matter and kept in normal saline. The earthworms 4-6cm in length and 0.1-0.2cm in width were selected for the study. *Pheretima posthuma* was used for present experiment because of their anatomical and physiological resemblance with intestinal roundworms present in the human body.

### Chemical and Reagents

All the chemicals including Albendazole and reagents were procured from local suppliers and were of analytical grade.

### Preparation of Extract

Shade dried and powdered aerial parts (100g) of *Bauhinia variegata* was soaked in rectified spirit in a round bottom flask. After soaking it for one day, it was refluxed with ethanol 95% (2 Litre) for 3 hours and the clear solution was decanted off. The extraction was repeated thrice. The combined extract was concentrated to a semisolid consistency. Thus total ethanolic extract was obtained. The fractionation of the ethanolic extract was carried out using solvents in the increasing order of polarity i.e. chloroform & ethyl acetate. Each fraction was concentrated, weighed and stored for further studies (Harborne, 1998).

### Preparation of Simple Syrup

66.7 gm of sucrose was weighed and added to purified water and heated until it dissolved with occasional stirring. Sufficient boiling water was added to produce 100 ml.

### Preparation of herbal syrup

One gram of each extracts of *Bauhinia variegata* were dissolved in simple syrup IP and the volume was made up to 100 ml.

**Table 1: Composition of herbal syrup.**

Sl.NO	Ingredients.	Required quantity.(mg/ml)
1.	Alcoholic extract of plant.	1gm.
2.	Simple syrup.	100ml.

### Evaluation of Formulated Polyherbal Syrup

The polyherbal syrup was evaluated for various parameters such as physical appearance (Colour, Odour, and Taste), pH, weight/ml and viscosity. Stability study and anthelmintic activity was also carried out. In vitro anthelmintic activity was carried out on earthworms. Evaluation of the organoleptic parameters of the herbal syrup revealed that the syrup was dark brown colour and had a pleasant odour and sweet taste.

### Organoleptic parameters of the formulated herbal syrup Parameter and Result

SL NO	PARAMETER	RESULT
1	COLOUR	Dark Brown
2	ODOUR	Pleasant
3	TASTE	Sweet

Evaluation of the physicochemical parameters of the herbal syrup revealed that the syrup had a weight/ml of 1.989 g/ml. Viscosity and pH of herbal syrup was 2.012 poise and 6.4 respectively. Refractive Index of herbal syrup was also determined.

### Physicochemical Parameters of the formulated herbal syrup

SL NO	PARAMETER	RESULT
1	Weight/ml	1.989 g/ml
2	Viscosity	2.012poise
3	Refractive Index	1.458
4	pH	6.4

## PHARMACOLOGICAL SCREENING

### Anthelmintic Activity

The worms were divided in different groups and each group contained six worms. Albendazole (25mg/ml, 50 mg/ml, and 100 mg/ml) was used as reference standards. Normal saline were used as control. All the test solutions and standard drug solutions were prepared freshly before starting the experiment. Three concentrations of extracts and formulated syrup were prepared in normal saline and used for this study like Extract of leaves of *Neolamarckia cadamba* (50mg/ml, 100mg/ml, and 200mg/ml), Extract of barks of *Alstonia scholaris* (50mg/ml, 100mg/ml, 200mg/ml) and formulated polyherbal syrup (50mg/ml, 100mg/ml, 200mg/ml). Observations were made for the time of paralysis and death. Time of paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death time was noted when worms lost their motility followed with fading away their body colours. All experiments were carried out in accordance with the guideline of the Institutional Bio safety and Ethical Committee.

### Statistical Analysis

All graph drawings and statistical calculations were performed using Microsoft excel. All values are expressed as Mean  $\pm$  SEM.

## RESULTS AND DISCUSSION

The primary objective of this work was to develop herbal syrup from aerial parts of *Bauhinia variegata*. The development of such herbal formulation will mark an important advancement in the area of phytopharmaceuticals. The result of the anthelmintic activity showed the single extract of the plant have significant anthelmintic activity, and also herbal syrup has good effect on earthworms have comparable activity to that of Albendazole. Thus it can be concluded that

these formulated herbal syrup could be suitable dosage form from aerial parts of *Bauhinia variegata*.

#### Anthelmintic activity of alcoholic extract

Group.	concentration used(mg/ml)	Time taken for paralysis(mg/ml).	Time taken for death(mg/ml).
Standard	50	18.5±2.723.	23.73±2.23
	100	13.2±1.2.	19.33±1.7
	200	7.33±4.33	10.46±2.3
Ethanol extract.	50.	15.35±3.3	20.34±1.2
	100.	12.12±1.3	15.66±6.7
	200.	9.234±4.56	10.39±2.11
Herbal syrup	50.	18.5±2.723	23.73±2.33
	100.	13.2±1.2	19.33±1.7
	200.	9.33±4.33	11.98±2.3

#### ACKNOWLEDGEMENTS

The authors are grateful to the management of Prime College of Pharmacy, Palakkad for their encouragement and providing facilities for this work.

#### REFERENCES

- John H. Block & John M. Beale Jr. Wilson & Gisevold, Textbook of Organic chemistry 11th ed., 2007; 264.
- Ashutosh Kar. Medicinal Chemistry. New Age International Publication, 2004; 65.
- A Review on Anthelmintic drugs and their future scope: Piyush Yadav, Rupali Singh, 2011.
- Use of plants in novel approaches for control of gastrointestinal helminthes in livestock with emphasis on small ruminants: Githiori. J.B, Athanasiadou. S and Thamsborg S.M., 2006.
- Traditional Antihelmintic, Antiparasitic and repellent use of plants in central Italy: Guarrera P.M., 1999.
- Book of Botanical medicine in Clinical practice: Min, Ronald Ross Watson, Victor. R. Preedy, 2008.
- Anthelmintic activity of *Artemisia brevifolia* in sheep: Iqbal. Z, M. Lateef, M. Ashraf, A. Jabbar, 2004.
- Molecular identification and phylogenetic analysis of baculoviruses from *Lepidoptera*: Jehle J.A, Lange. M, Wang. H, Hu Z, Wang. Y, Hauschild. R., 2006.
- Effect of grass or cassava foliage on growth and nematode parasite infestation in goats fed low or high protein diets in confinement: Seng Sokerya and Preston. T.R., 2003.
- Growth performance and parasitic infestation of goats given cassava leaf silage or sun dried cassava leaves; A supplement to grazing in lowland and up land regions of Cambodia: H.O Bunyeth and Preston. T.R., 2006.
- Psychometric properties of the long and short versions of the young Schema Questionnaire: core beliefs among bulimic and comparison women: Waller. G, Meyer. C, Ohanian. V., 2001.
- Assay of Nematocidal activity of isoquinoline alkaloids using third stage larvae of *Strongyloides ratti* and *S. Satuo*. T, Koga. M, Matsuhashi. R, Koile. K, Tada. I and Nikaido. T., 2002.
- Chemical and biological properties of an extracellular lipopolysaccharide from *Escherichia coli* grown under lysine-limiting condition: Taylor. A, Knox. K.W, Work. E., 1966.
- Anthelmintic activity of *Leucaena leucocephala* seed extract on *Haemonchus contortus* infective larvae: Isaiah Oluwafemi Ademola, Olaleunle. S. Idowa, 2006.
- Investigation of in vitro anthelmintic activity of *Thespesia Lampas*(CAV): Satish. B.Kosalge, Ravindra. A.Fursule., 2009.
- Cytotoxicity of selected Camerounian medicinal plants and *Nauclea Pobequinii* towards multi-facorial drug-resistant cancer cell: Victor kuete, Thomas Efferth, Louis. P. Sandjo, Armella. T. Mbaveng, Jackson A.Seukep, Bonaventure. T. Nagadji, 2015.
- Comparative Evaluation of Anthelmintic potential of *Bauhinia variegata*: Varsha Tiwari, 2015.
- In vitro Anthelmintic activity of *Luffa cylindrical* Leaves in Indian Adult Earthworm: Sangh Partap, 2012.
- In vitro Anthelmintic activity of *Acorus Calamus* leaves: Tejendra bhakti, 2013.
- Anthelmintic activity of stem bark of *Bauhinia purpurea* Linn: Chandrasekhar, Gupta Daksha, Richard Lobo and Gupta Nilesh, 2012.
- In vitro Anthelmintic activity of *Leonotis neptifolia* (L): K. Gnaneswaril, 2013.
- In vitro Evaluation of Anthelmintic activity of *Hedychium Spichatum* rhizome and *Zingiber Zerumbet* rhizome on *Pheritima posthuma* model: Shambuditya Goswami, 2011.
- Investigation of in vitro Anthelmintic activity of *Cleorodendron Inerme*: Mondal Subhasish, 2010.
- Comparative study of Anthelmintic activity between aqueous and ethanolic extract of *Solanum surattense* linn: Bhabani S. Nayak, 2009.

25. Evaluation of Anthelmintic activity of *Coccinia indica* (fruit): Yogesh Shivhare, Prashant sohi, Priya Singh, Sonal Dangi, Sourabh.S, Baghel, 2011.
26. Indian journal of Natural products and Resources: T. Ghosh, T.K. Maity, A. Bose, D.K. Dash, 2005.
27. International journal of Applied Biology and pharmaceutical Technology: S. Vidhyadhar, M. Saidulu, T.K Gopal, D. Chamundeeswari, Uma maheswara Rao, David Banji, 2010.
28. International journal of Chemical and Pharmaceutical science: R.D Dubey, S. Verma, D. Rane, V.K Wani, A.K Pandey, S.Paroha., 2010.