

Evaluation of anthelmintic activity of herbal plant extracts

Jawed Akhtar, Amrita Bhajji, Supyar Singh

RKDF College of Pharmacy Bhopal M.P.

Sarvepalli Radhakrishnan University, Bhopal M.P.

Article Info: Received: 25-08-2024 / Revised: 23-09-2024 / Accepted: 08-10-2024

Address for Correspondence: Jawed Akhtar (jawedakhtar25195@gmail.com)

Conflict of interest statement: No conflict of interest

Abstract

The discovery and development of new chemical substances for helminthic control is greatly needed and has promoted studies of traditionally used anthelmintic plants, which are generally considered to be very important sources of bioactive substances. A variety of screening procedures made by researchers to explore the potent anthelmintic active molecules. An attempt is made to provide a direction for further research in finding new molecules with possible mechanisms. Hence, the need for the exploration of the plants for the treatment has attained a great interest

KEYWORDS: Plant, Extracts, Helminthic, Anthelmintic

Introduction

Plant is one of the foremost forms of life on earth. It can produce its own food but cannot change about. Plants have well prearranged structures. They are beautiful and they determine local climates and are used as live fences. They protect and cool our environment. It is therefore impossible to talk about life without plants because of their importance to the balance of nature. The expansion of traditional medicinal systems incorporating plants as means of therapy can be traced back to the middle Palaeolithic age some years ago as found from fossil studies. [1] A lot of work has been done in the field of plant anthelmintic including both ethno botanical surveys and scientific validation of their anthelmintic efficacies in many parts of the world. Unfortunately, no such work has been done so far in Kashmir valley, India. There is a need to explore this natural treasure in this geographically peculiar region before being it is lost owing to the worldwide rapid decline in medicinally important flora. The valley harbours a rich and unique flora of medicinal plants being distinct from those in the rest of the

country and other parts of the world. [2] So the discovery and development of new chemical substances for helminthic control is greatly needed and has promoted studies of traditionally used anthelmintic plants, which are generally considered to be very important sources of bioactive substances. A variety of screening procedures made by researchers to explore the potent anthelmintic active molecules. An attempt is made to provide a direction for further research in finding new molecules with possible mechanisms. [3] Hence, the need for the exploration of the plants for the treatment has attained a great interest and this research gives the list of few medicinal plants that were capable of reducing the helminthic infection.

EXPERIMENTAL WORK

Collection of plant material

The plant seeds of *Terminalia Paniculata* were collected from available graphical sources. The plant drugs were identified, collected and stored for further use.

Preparation of plant material

The collected *Terminalia Paniculata* seeds was washed with tap water. The plant seeds were crushed into small pieces and air-dried thoroughly under shade for 1 month to avoid direct loss of phytoconstituents from sunlight. The shade dried materials were powdered using the pulveriser and sieved up to 80 meshes. It was then homogenized to fine powder and stored in air-tight container for further analysis.

Preparation of plant extracts

Collected moderately coarse plant powder of *Terminalia Paniculata* was used for the preparation of various extracts. The plant seeds powder of the *Terminalia Paniculata* was extracted with petroleum ether, methanol and water using as solvent respectively by continuous hot extraction. The residue was evaporated by filtration through whatmann No. 1 filter paper and the aqueous extract was concentrated used on a Rotary evaporator to get solid yield extract.

Evaluation of Anthelmintic activity of plant extracts

The plant extracts of *Terminalia Paniculata* were evaluated for anthelmintic activity in *Pheretima posthuma* (earth worm) of nearly equal size. *Pheretima posthuma* is used due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability of earthworms, they have been used widely for the initial evaluation of the anthelmintic compounds. The worms were acclimatized to the laboratory condition before experimentation. The earthworms were divided

into five groups of six earth worms in each and placed in eight petri dishes containing the extract solutions or the reference drugs as mentioned below;

- Group -1: Received distilled water which served as the control
- Group-2: Received albendazole suspension at a dose of 10mg/ml which served as the standard
- Group-3: Received Petroleum ether extract at a dose of 250mg/ml
- Group -4: Received Methanolic extract at a dose of 250mg/ml
- Group-5: Received Aqueous extract at a dose of 250mg/ml

All Petri dishes were kept under room temperature. The living or viable worms were kept under close observation. Observations were made for time taken to complete paralysis and death for individual worms. Each worm was frequently applied with external stimuli which stimulates and induce movement in earthworms, if alive. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lose their motility followed with fading of the body colour. [4,5]

RESULTS AND DISCUSSION

The plant leaves powder of the *Terminalia Paniculata* was extracted with petroleum ether, methanol and water using as solvent respectively. The solvent was removed and practical yield was found and recorded. The results were shown in Table 1.1

Table 1.1: Extractive values of *Terminalia Paniculata*

Solvent	Yield (g)	% Yield
Petroleum ether	11.0g	13.75%
Methanol	13.5g	16.87%
Water	08.2g	10.25%

Table 1.2: In-vitro anthelmintic activity of different extracts of *Terminalia Paniculata*

S.N.	Groups	Concentration mg/ml	Time taken for Paralysis (in min Mean)	Time taken for Death (in min Mean)
1	Control (Distilled water)	-----	00	00
2	Standard (Albendazole)	250	24±0.50	47±0.20
3	Petroleum ether extract	250	35±0.25	68±0.10
4	Methanolic Extract	250	27±0.20	55±0.50
5	Aqueous Extract	250	32±0.40	62±0.20

CONCLUSION

The findings showed that methanolic extract (250 mg/ml concentration) possess comparable anthelmintic activity with standard drug. The results showed that plant has the potential to be used as anthelmintic. Therefore, further study must be carried out so that the general people can get definite advantage from this important medicinal plant.

REFERENCES

1. Farnsworth NR. Biological and Phytochemical Screening of Plants. Journal of Pharmaceutical Science. 1996; 55: 225-276.
2. Darshan S, Ved DK. A balanced perspective for management of Indian medicinal plants. Indian Formulary. 2003; 129: 275-288.
3. Joyamma Varkey, Seema S Nair. Phytochemical, Physico Chemical and Elemental Analysis of Leaves and Stem of *Pothos scandens* Linn. International Journal of Pharmacognosy and Phytochemical Research. 2019; 11(2); 37-43.
4. Mali RG, Mahta AA. A review of anthelmintic activity of *Baliospermum montanum* Muell roots. Indian Journal of Pharmaceutical Science. 2008; 70:131- 133.
5. Patel Jitendra, Kumar GS, Md. Shamim Qureshi, Jena PK. Anthelmintic activity of Ethanolic extract of whole plant of *Eupatorium Odoratum*. L. International Journal of Phytomedicine. 2010; 2: 127-132.