

Anthelmintic Activity of Bark of *Acacia nilotica* Linn on *Pheretima posthuma*

Chaudhari PS*, Gadilohar NR, Girase AM, Suryawanshi HP, Pawar SP

P. S. G. V. P. Mandal's, College of Pharmacy, MSH1, Untavad, Maharashtra 425409, India

Original Research Article***Corresponding author**
Chaudhari PS**Article History**

Received: 20.07.2018

Accepted: 11.08.2018

Published: 30.08.2018

DOI:

10.21276/sjmeps.2018.4.8.5



Abstract: The aqueous and chloroform extracts of *Acacia nilotica* linn belonging to the family Fabaceae were evaluated for anthelmintic activity. The dried powder of *Acacia nilotica* bark was extracted and the activity was studied. Both aqueous and chloroform extract collected were tested for anthelmintic activity against Indian adult earthworm *Pheretima posthuma* (Annelida) and recorded the time taken for induction of paralysis and death. Two concentrations (25 mg/ml and 50 mg/ml) of aqueous and chloroform were evaluated in the bioassay involving determination of time of paralysis (P) and time of death (D) of the worms. Piperazine citrate (10 mg/ml) was used as reference standard and normal saline solution as a control. Comparative results of present study indicated that the aqueous and chloroform extracts of leaves of *Acacia nilotica*, linn shows significantly dose depending pharmacological activity on the earthworms.

Keywords: Anthelmintic activity, *Pheretima posthuma*, *Acacia nilotica*, Piperazine citrate and vermifuge.

INTRODUCTION

Disease: Anthelmintics are drugs that expel parasitic worms (helminths) from the body, by either stunning or killing them. They may also be called vermifuge (stunning) or vermicides (killing). This includes both flat worms, e.g., flukes and tapeworms and round worms, i.e., nematodes. Helminth infection is the most common infection in human beings as well as animals which affects the large proportion of world's population. In the treatment of parasitic diseases anthelmintics are used accidentally [1]. Keeping this in view, the present study deals with the evaluation of the anthelmintic activity of *Acacia Nilotica* [2].

MATERIALS AND METHODS**Collection and Authentication of Plant material**

Fresh whole plant (leaves, stems, roots, bark and flowers) of *Acacia Nilotica* were collected from Satpuda region of Shahada and authenticated by Dr. S. K. Tayade, (Head of Dept. of botany) P. S. G. V. P. Mandal's Arts, Science, and Commerce College, Shahada, Dist-Nandurbar (MS). After authentication, bark of plant was collected, powdered and dried under shade for a period of 7 days and then pulverized in mechanical grinder to obtain coarse powder. The dried bark powder was stored in airtight bottles.

Extraction methodology [3, 4]**Aqueous extract**

The coarse bark powdered material (each 100 gm) was soaked in distilled water (500ml) by Maceration technique for continuous 72 hours and then strained and the concentrate was evaporated on water bath until concentrate (syrupy consistency) is left and then evaporated to dryness.

Chloroform extract

The coarse bark powdered material (each 100 gm) was soaked in chloroform (500ml) by Maceration

technique for continuous 72 hours and then strained and the concentrate was evaporated on water bath until concentrate (syrupy consistency) is left and then evaporated to dryness.

Worms Collection

Healthy adult earthworms (*Pheretima posthuma*) were used to evaluate anthelmintic activity in *vitro*. Earthworms were collected from the water logged areas of soils along Lonkheda road Shahada. The average size of earthworm was 6-8 cm.

Drugs and chemicals

- Piperazine citrate.
- Saline solution.

ANTHELMINTIC ACTIVITY

The anthelmintic assay was carried out as per the method of Ajaiyeoba *et al.*, [5] The assay was performed in *vitro* using adult earthworm (*Pheretima posthuma*) owing to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings for preliminary evaluation anthelmintic activity [6-8].

Test samples of the extract was prepared at the concentrations 25 and 50 mg/ml in distilled water and six worms i.e. *Pheretima posthuma* of approximately equal size (same type) were placed in each 9 cm Petri dish containing 25 ml of above test solution of extracts. Piperazine citrate (10 mg/ml) was used as reference standard and saline solution as control [9-11]. All the test solution and standard drug solution were prepared freshly before starting the experiments. Observations

were made for the time taken for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C). All the results were expressed as a mean \pm SEM of six worms in each group.

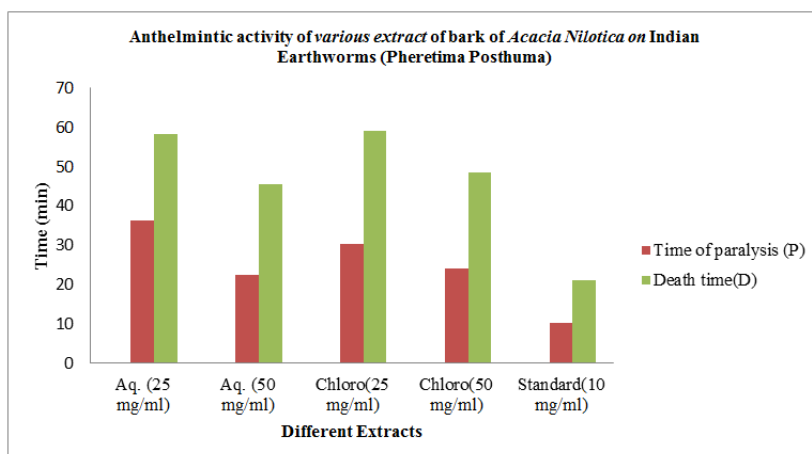
Table-1: Anthelmintic activity of bark of *Acacia Nilotica* extracts on Indian earthworm (*Pheretima posthuma*)

Sr. No.	Extracts	Conc. (mg/ml)	Indian Earthworms (<i>Pheretima posthuma</i>)	
			Time of Paralysis (P) in min.	Death Time (D) in min.
1	Aqueous	25	36.22 \pm 1.42	58.20 \pm 1.12
		50	22.54 \pm 2.12	45.66 \pm 1.44
2	Chloroform	25	30.24 \pm 1.86	59.10 \pm 1.16
		50	24.12 \pm 0.98	48.44 \pm 2.0
3	Control (Saline Sol)	-	-	-
4	Standard (Piperazine Citrate)	10	10.42 \pm 1.12	21.10 \pm 1.44

STATISTICAL ANALYSIS

The data presented as Mean \pm SEM. The activities of the leaves extracts were compared with the

control. All the extracts showed significantly higher duration of paralysis and death. Values of $P < 0.001$ were considered statistically significant [12, 13].



Graph-1: Anthelmintic activity of bark of *Acacia Nilotica* extracts on Indian earthworm (*Pheretima posthuma*)

RESULTS AND DISCUSSION

From the observations made, higher concentration of extract produced paralytic effect much earlier and the time to death was shorter for all worms. Both the aqueous and chloroform extract showed anthelmintic activity in dose-dependent manner giving shortest time of paralysis (P) and death (D) with 50 mg/ml concentration, for worms. Evaluation of anthelmintic activity was compared with reference standard Piperazine citrate. From the above results, it is concluded that *Acacia Nilotica* used by tribals traditionally to treat intestinal worm infections, showed significant anthelmintic activity. 50 mg/ml Chloroform extract exert paralytic effect in 24.12 \pm 0.98 and death time in 48.44 \pm 2.0. The experimental evidence obtained in the laboratory model could provide a rationale for the traditional use of this plant as

anthelmintic. The plant may be further explored for its phytochemical profile to recognize the active constituent accountable for anthelmintic activity.

CONCLUSION

From the above results, it is concluded that the chloroform extract of *Acacia Nilotica* Linn shows potent anthelmintic activity compared to standard anthelmintic drug. Further studies using in vivo models are required to carry out and establish the effectiveness and pharmacological rationale for the use of *Acacia Nilotica* Linn as an anthelmintic drug. The drug can be further explored for the isolation and characterization of the active constituents responsible for anthelmintic activity.

ACKNOWLEDGEMENT

The authors are thankful to Dr. S. P. Pawar, Principal, P. S .G. V. P. M's College of Pharmacy, Shahada for providing necessary facilities to carry out present research work. Dr. Santosh Tayade for authentication of plant specimen. The authors are also grateful to staff of forest department, Toranmal for their kind help during field visits and tribal people who shared their traditional knowledge regarding medicinal plants during our field visits.

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