

Formulation and Evaluation of Polyherbal Anthelmintic Preparation

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ABSTRACT

The present study was done with the aim to formulate an anthelmintic preparation and to evaluate anthelmintic activity of formulation containing traditionally user herbs viz., *Plumbago zeylanica* (leaves), *Hyoscyamus niger* (roots) and *Abultion indicum* (leaves) using adult earthworm *Pheritima posthuma*. The aqueous and ethanolic extract of the crude drug of different concentration were tested which involve determination of paralysis time and time to kill the worms. Piperazine citrate was used as standard and it was found that the PHFEE activity is higher than PHFAE.

Key-Words: Anthelmintic activity, Piperazine citrate, Earthworm, Polyherbal formulation aqueous extract (PHFAE), Polyherbal formulation ethanolic extract (PHFEE).

INTRODUCTION

Helminthic infections are now being recognized as cause of many acute as well as chronic ill healths among the various human beings as well as cattle's. More than half of the population of the world suffers from infection of one or the other and majority of cattle's suffers from worm infections.¹ Traditional system of medicine reports the efficacy of several natural plants in eliminating worms², keeping this view the present work was conceived by us to evaluate the anthelmintic activity of polyherbal formulation.

MATERIAL AND METHODS

Collection of Plant Materials

The plants *Plumbago zeylanica* (leaves), *Hyoscyamus niger* (roots) and *Abutilon indicum* (leaves) were collected from the local villagers of Rewa District of Madhya Pradesh, India during July-September 2008 and then authenticated and confirmed by Dr. S. N. Dwivedi, Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, Madhya Pradesh, India. The plant parts after collection were shade dried, powdered (40 mesh size) to get a coarse powder.

Preparation of Extract

The dried powder material of *Plumbago zeylanica* (leaves): 50 gm, *Hyoscyamus niger* (roots): 100 gm and *Abutilon indicum* (leaves): 50 gm, were thoroughly mixed, taken in 1 lit. beaker and distilled water in sufficient quantity was added, then it was kept for maceration for 72 hours. The aqueous extract obtained was filtered and concentrated on hot plate. The ethanolic extract were obtained by Soxhlet extraction process, the extract obtained was filtered and concentrated.

Experimental Model

Adult earthworm (*Pheretima prosthuma*) were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being) from moist soil, obtained from Agriculture College Rewa, M.P.-India and washed out of sand. Four groups of approximately equal size earthworms (8±1 cm) consisting of six earthworms in each group were used for the present study.^{3,4,5}

Standard Drug

Piperazine citrate is taken as standard drug and the concentration of the standard drug was prepared in 1% normal saline to obtain 0.5, 0.75 and 1.0 gm% concentration.

Test Drug

The PHF extract (both aqueous and ethanolic) were prepared in minimum quantity of distilled water and diluted to 15 ml with normal saline to obtain 0.5, 0.75 and 1.0 gm% concentration.

Anthelmintic Investigation

Four groups of approximately equal size earthworms consisting of six earthworms in each group were used for the present study. Group first serve as control, receive only normal saline; Group second serve as test-1, receive PHFAE; Group third serve as test-2, receive PHFEE and Group four serve as standard, receive standard drug piperazine citrate of different concentration. Observations were made for the time taken to paralysis and death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body color.^{5,6,7}

Statistical analysis

The results were analysed for statistical significance using one-way ANOVA followed by Dunnett's 't' test and are presented in (Table 1).

RESULTS AND CONCLUSIONS

The PHF of aqueous (PHFAE) and ethanolic (PHFEE) extracts showed significant anthelmintic activity. The result of anthelmintic activity of PHF on earthworms *phertima prosthuma* were given in Table 1. It was concluded from the present study that the PHFEE of *Plumbago zeylanica* (leaves), *Hyoscyamus niger* (roots) and *Abultion indicum* (leaves) showed marked and potent anthelmintic activity than the PHFAE of *Plumbago zeylanica* (leaves), *Hyoscyamus niger* (roots) and *Abultion indicum* (leaves) as compared to standard drug. Therefore, it was further concluded that the mixture of these three herbs will lead to the preparation which will effectively kill the worms and serves as a better anthelmintic preparation.

Table 1: Anthelmintic activity of PHF.

S/N	TREATMENT	CONC. (gm %)	PARALYSIS TIME (min.)	DEATH TIME (min.)
1.	Control	0.5	-	-
		0.75	-	-
		1.0	-	-
1.	Test Drug -1 (PHFAE)	0.5	60±0.85	106±1.15
		0.75	40±0.52	80±0.93
		1.0	25±0.36	55±0.67
2.	Test Drug -2 (PHFEE)	0.5	70±0.96	115±1.07
		0.75	40±0.85	85±0.1.15
		1.0	30±0.78	70±0.88
3.	Standard Drug (Piperazine citrate)	0.5	43±0.65	90±1.42
		0.75	30±0.59	70±0.97
		1.0	23±0.41	50±1.10

Results expressed as Mean ± SEM from 6 observations, p<0.001 as compared to standard.

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REFERENCES

1. Dwivedi S N, Herbal remedies among the tribals of Sidhi District of Madhya Pradesh, *Jour. of Econ. Tax. Bot.*, 20(3), 2004, 675-687.
2. Dwivedi S, Dwivedi S N, Shrivastava S, Dwivedi A, Dwivedi S and Kaul S, Relevance of medicinal herbs used in traditional system of medicine, *Farmavita. Net*, 2007, Aug.
3. Blakemore R, Diversity of exotic earthworms in Australia- A status report. Transactions of the Royal Zoological Society of New South Wales, 1999.
4. Gunasekhararan R, Divyakant A, Senthilkumar KL, Anthelmintic activity of bark of *Neolamarckia cadamba* Roxb., *Ind. J. Nat. Prod.*, 22(1), 2006, 11-13.
5. Dwivedi S., Dwivedi A., Kapadia R. and Kaul S.(2008). Anthelmintic activity of alcoholic and aqueous extract of fruits of *Terminalia chebula* Retz., *Ethno. Leaflets*, 12:741-743.
6. Kailashraj R. and Kurup A., *Ind. J. Phar.*, 1962, 74.
7. Jayachandran E., Bhatia K., Naragunda, LVG and Roy A., *Indian Drugs*, 2003, 40 (7), 408.