

IN VITRO ANTHELMINTIC ACTIVITY OF AQUEOUS AND METHANOLIC LEAF EXTRACT OF *Tephrosia purpurea* LINN.

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ABSTRACT

Tephrosia purpurea is a copiously branched herbaceous perennial plant distributed throughout the tropics which is used in the treatment of bronchitis, diuretic, pimples, tonic, laxative, cough, and tumour. The present study is an attempt to explore the anthelmintic activity of aqueous and methanolic extract of leaves of plant *Tephrosia purpurea*. The various concentrations of aqueous and methanolic extract were evaluated for their anthelmintic activities on adult Indian earthworms, *Pheretima posthuma*. The activities are well compared with the standard drug Albendazole. The data were verified as statistically significant by using one way ANOVA at 5% level of significance ($p < 0.05$).

Keywords: *Tephrosia purpurea*, Anthelmintic activity, Methanolic leaf extract.

INTRODUCTION

Helminthic infections are the most common infections in humans, and pose a large threat to public health. Helminthes also affect millions of livestock resulting in considerable economic losses in farm yard animals¹. The Helminthic infections which infect the intestine are cestodes eg. tape worms (*Taenia solium*), nematodes e.g., hookworm (*Ancylostoma duodenale*), roundworm (*Ascaris lumbricoids*) and trematodes or flukes (*Schistosoma mansoni* and *Schistosoma hematobolium*)²⁻⁴. Because of limited availability and affordability of modern medicines most of the world's population depends to a greater extent on traditional medical remedies.

Tephrosia purpurea linn (Family : Fabaceae) is a copiously branched herbaceous perennial plant distributed throughout the tropics and commonly known as *Sarponkha* in India. According to the Ayurvedic literature the plant is called "Sarwa wranvishapaka" which means that it has the property of healing all types of wounds⁵. The plant has been used in the treatment of bronchitis, diuretic, pimples, tonic, laxative, cough and tumour⁶. The leaves are reported to be useful in jaundice⁷. Despite the wide use of *Tephrosia purpurea* in folk medicine, the anthelmintic activity of the plant extract has not been reported in the literature. In the present study, anthelmintic potential of

aqueous and methanolic extract of leaf have been evaluated by comparing with the standard drug albendazole.

MATERIALS

The leaves of *Tephrosia purpurea* was collected from Mangalagiri, Guntur Dist, Andhra Pradesh. The plant was identified and authenticated by Prof.Z.Vishnuvardhan Ph.D., Department of Botany Acharya Nagarjuna University. The leaves were cleaned, dried under room temperature, pulverized first with hand grinder and with the help of electric grinder.

The powder was extracted in a soxhlet apparatus using methanol and distilled water. Extracts were subjected to rotary vacuum evaporation⁸. Various physico-chemical analysis were performed to identify the chemical constituents⁹⁻¹⁰.

Most of the screening reported are *in-vitro* studies using some worm samples like Indian earthworm *Pheretima posthuma*, *Ascardia gall*, *Ascaris lumbricoids*, etc. Adult Indian Earthworm, *Pheretima posthuma* has been used as test worm in most of the anthelmintic screenings, as it shows anatomical and physiological resemblance with the intestinal round worm parasites of human¹¹⁻¹².

METHOD

The anthelmintic activity was performed as per the method of Pal *et al*¹³ with minor modifications. Nine groups containing six earthworms each of approximately equal size were released into 10ml of desired formulation each group was treated with albendazole, methanolic extract and aqueous extract. Time for paralysis was noted when no movement could be observed with a slight pin prick method. Time for death of individual

earthworms was recorded when the worms showed no movement either by vigorous shaking or by dipping in warm water.

The data on biological studies were reported as mean \pm standard deviation (n=5) for determining the statistical significance, standard error mean and analysis of variance (ANOVA) at 5% level significance was employed. $P < 0.05$ were considered significant¹⁴.

RESULTS

Table 1: Anthelmintic effect on Methanolic Leaf Extract of *Tephrosia purpurea* linn.on *Pheretima posthuma*.

Group	Concentration of extract IN	Time taken in minutes \pm sem	
		paralysis	death
Albendazole	20	19.50 \pm 5.12	36.00 \pm 26.13
	40	14.30 \pm 5.77	30.50 \pm 15.21
	60	13.10 \pm 4.12	22.30 \pm 9.01
Methanolic Extract	20	20.41 \pm 3.12***	35.12 \pm 4.21***
	40	15.21 \pm 2.13***	26.15 \pm 3.10***
	60	12.5 \pm 3.12***	18.12 \pm 2.21***
Aqueous Extract	20	22.12 \pm 3.12	37.10 \pm 3.51
	40	18.14 \pm 2.13	28.10 \pm 2.10
	60	14.16 \pm 1.51	19.01 \pm 3.12

Preliminary phytochemical screening of methanolic leaf extract of *Tephrosia purpurea* showed the presence of alkaloids, carbohydrates, flavanoids, tannins, phenolic compounds. Data revealed that methanolic extract of *Tephrosia purpurea* leaves possessed dose dependent and significant anthelmintic activity when compared with the standard drug albendazole on earthworm. The time required for causing paralysis (P) in case of methanolic extract is 12min and death (D) in 18 min, while aqueous extract showed P and D in 14 & 19, respectively. Albendazole showed 6 & 13 in for the same observations.

The predominant action of albendazole on worm is inhibitory action on micro tubular function. The methanolic leaf extract not only shows paralysis but death of the organism with increasing concentration.. Phytochemical analysis of methanolic leaf extract showed the presence of tannins and phenolic compounds as one of the chemical constituents along with alkaloids. Tannins and phenolic compounds were shown to possess anthelmintic activity¹⁵⁻¹⁶. Tannins are found to bind to free proteins in the gastrointestinal tract of the host animal or glycoprotein on the cuticle of the parasite and cause death¹⁷.

CONCLUSION

The anthelmintic activity of leaves of *Tephrosia purpurea* was evaluated by comparing it with the standard drug albendazole. The extract is further studied to isolate active principle compounds.

ACKNOWLEDGEMENTS

The authors are grateful to Sr.Showrilu correspondent & secretary, Nirmala college of Pharmacy, Atmakur for providing support and facilities for our work.

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