

BIOLOGICAL EVALUATION OF ANTHELMINTIC ACTIVITY OF ROOT EXTRACT OF *Tephrosia Purpurea* IN INDIAN ADULT EARTHWORM

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ABSTRACT

Tephrosea purpurea is a copiously branched herbaceous perennial plant distributed throughout the tropics which is used in the treatment of diuretics, pimple, tonic, laxative, cough, tumour and bronchitis. The present study is an attempt to explore the Anthelminthic activity of aqueous and methanolic extract of roots of plant *Tephrosea purpurea*. The various concentrations of aqueous and methanolic extract were evaluated for their Anthelminthic activities on adult Indian earthworms *Isonia Foetida*. The activities are well compared with the standard drug Piperazine citrate. Methanolic and aqueous extract of roots of

Tephrosea purpurea shows significant anthelmintic activity in Indian adult earthworms.

KEYWORDS: *Tephrosea purpurea*, Anthelminthic activity, Earthworms, Methanolic root extract and aqueous root extract.

INTRODUCTION

Tephrosea purpurea commonly known as Thila in Gujarati, Sarpankh (Hindi), Unhali (Marathi) is not official in Ayurvedic Pharmacopoeia.^[1] It is one of the plant for human being made and gifted by the nature having composition of all essential constituent that are required for good human health.^[2,3] Medicinally, all parts of the plant have tonic and laxative properties. The root is having bitter bad taste and it is an alexipharmic used in snake bite poisoning, ulcers, wounds, diarrhoea, bronchitis, asthma, inflammation, boils, pimples, enlargement of the spleen.^[4,5] Leaves are tonic to the intestine, improves the appetite, useful

in diseases of lungs and chest, good in piles, syphilis and gonorrhoea. The seeds are useful in poisoning due to rat-bite. The whole plant is bitter in taste and acrid, digestible, alexeteric, antipyretic, and cures diseases of liver, spleen, heart, kidney, blood, tumours, ulcers, leprosy, asthma, caries of the teeth and febrile attacks. Fresh root bark ground and made into a pill, with a little black pepper, is frequently given in cases of obstinate colic. *Tephrosia purpurea* has revealed the presence of glycosides, retinoid, isoflavones, flavanones, chalcones, flavanols, and sterols. It is also good source of minerals and amino acids. HPLC analysis of extract of flowering plant of *Tephrosia purpurea* shows presence of rutin and quercetin. Helminthes 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 animals.^[6] Helminthiasis or infection with parasitic worms are the most common infectious agents of humans in developing countries and produce a global burden of disease that exceeds better-known conditions i.e., tuberculosis and malaria.^[18] The disease is highly prevalent particularly in third world countries due to poor management practices.^[19] The Helminthes infections which infect the intestine are cestodes.^[7-9] In the present work the methanolic and aqueous extract of roots of *Tephrosia purpurea* were evaluated for its anthelmintic activity against earthworms. The activities of extract were compared with standard drug piperazine citrate.

Ethno pharmacological activities

Tephrosia Purpurea is used to cure several types of external wounds^[20] and gastro-duodenal disorders.^[21] The plant has also been claimed to cure kidney, liver spleen, heart and blood related disorders.^[21,22] The dried herbs are effective as tonic laxative, diuretics, and used in the treatment of bronchitis, bilious febrile attack, boils, pimples.

MATERIALS

Collection and Identification of Plant

The Roots of *Tephrosia purpurea* was collected from Mangalwedha taluka, Solapur district Maharashtra. The identification of plant and authenticated department of Botany Yaswantrao Chavan Institute of science, Satara District-Satara.

Pretreatment of Plant

The plant roots were initially cleaned, dried under room temperature. The dried roots were taken in mixture grinder and powdered. The powder was extracted in a Soxhlet apparatus using methanol and distilled water as a solvent. Extracts were subjected to rotary vacuum

evaporation.^[10] Various physico-chemical analysis were performed to identify the chemical constituents.^[11,12]

Preparation of Aqueous Extracts

Accurately weighed 30 gm of powder was packed in thimble flask and 300ml distilled water was added in 500ml round bottom flask. The vapours arising from the flask pass by the side tube into condenser. Then soxhlet assembly was set up to complete 9 to 10 cycles. After that the extract was filtered. Filtration of mixture was carried out. Filtrate was taken into petry plate and evaporated until it converted into semisolid concentrated juice. After that it was dried completely to get dried residue, which can be used to prepare the stock solution (w/v) and the % yield was found to be 7.56 % w/w and stored in the freezer.^[11]

Preparation of methanolic extraction

Accurately weighed 30 gm of powder was packed in thimble flask and 300ml methanol was added in 500 ml round bottom flask. The vapours arising from the flask pass by the side tube into condenser. Then soxhlet assembly was set up to complete 6 to 7 cycles. After that the extract was filtered. Filtration of mixture was carried out. Filtrate was taken into petry plate and evaporated until it converted into semisolid concentrated juice. After that it was dried completely to get dried residue, which can be used to prepare the stock solution (w/v) and the % yield was found to be 6% w/w and stored in the freezer.^[11]

Method

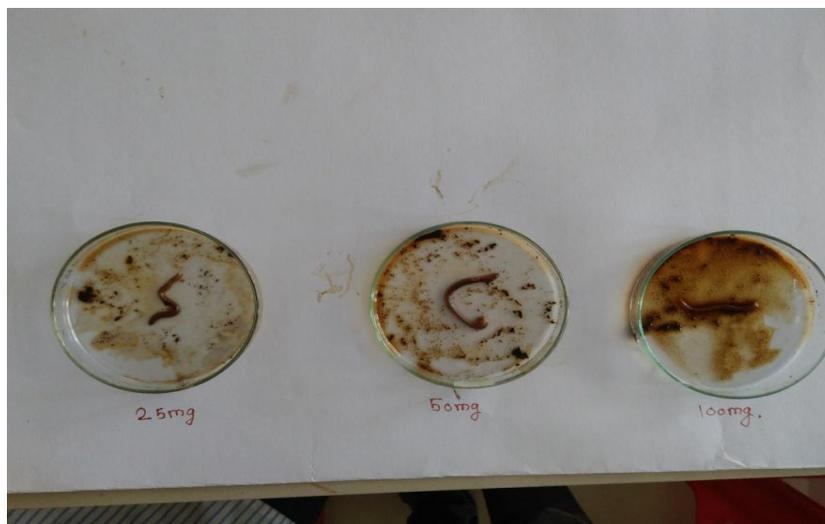
The anthelmintic activity was performed as per the method of Pal et al^[14] with minor modifications. Three groups containing one earthworms each of approximately equal size were released into 1ml of desired formulation each group was treated with piperazine citrate, methanolic extract and aqueous extract. Time for paralysis was noted when no movement is 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 40°c warm water.

Preliminary phytochemical screening of methanolic Root extract of *Tephrosia purpurea*

The hydroalcoholic extract was taken for various qualitative chemical tests to determine the presence of various phyto constituents like alkaloids, glycosides, carbohydrates, phenolics and tannins, phytosterols, fixed oils, protein and amino acids, flavanoids, saponins, gums and mucilage using reported method.^[10] The predominant action of Piperazine citrate on worm is

inhibitory action on micro tubular function. Phytochemical analysis of methanolic Root 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 activity.^[15,16]

Observation



“Fig. 1” Effect of *Tephrosia purpurea* of Aqueous extract on Indian adult earthworm.



“Fig: 2” Effect of *Tephrosea purpurea* Effect of Methanolic extract on Indian adult earthworm.

RESULTS AND DISCUSSION

Anthelmintic activity against earthworms

The methanolic and aqueous extracts of roots of *Tephrosea purpurea* were evaluated in Indian adult earthworms and time for paralysis and death is as given below:

Table no: 1

Group	Concentration of extract in mg/ml	Time taken in minutes	
		Paralysis	Death
Methanolic extract	25	15.33	24.33
	50	5.56	12.46
	100	3.36	6.56
Aqueous extract	25	21.32	40.25
	50	28.44	34.35
	100	9.42	14.36
Piperazine citrate	25	52.07	58.68
	50	30.10	33.06
	100	13.45	18.17

The activity was compared with standard drug piperazine citrate. Methanolic and aqueous extract both show significant anthelmintic activity against Indian adult earthworms. Methanolic extract shows more effect as compared to aqueous extract. The methanolic extract *Tephrosia Purpurea* confirmed paralysis as well as death of worms in a good time as compared to piperazine citrate especially in higher concentration of 100mg/ml. The aqueous extract also showed significant activity, Phytochemical analysis of the crude extracts revealed presence of saponin, steroids, alkaloids, triterpenoids and bitter principles as are the chemical constituents. Triterpenoids and bitter principals are known to have anthelmintic activity. 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 death.^[17]

CONCLUSION

From above study it is confirm that methanolic and aqueous extract of roots of *Tephrosia purpurea* shows anthelmintic activity In Indian adult earthworms.

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