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Research Article

**EVALUATION OF *IN-VITRO* ANTI-HELMINTHIC POTENCY
OF ETHANOLIC EXTRACT OF *TEPHROSIA PURPUREA***

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Article Received: March 2022**Accepted:** March 2022**Published:** April 2022**Abstract:**

Various species of genus *Tephrosia* have been extensively studied for their pharmacological activity. *Tephrosia purpurea* is expected to possess many constituents among them triterpenoids are major constituents. So due to presence of triterpenoids *Tephrosia purpurea* may possess Antihelmintic activity. In the present work ethanolic extract of leaves of *Tephrosia purpurea* was evaluated for its Anthelmintics activity against earthworm at three different concentrations (25, 50, 100 mg/ml). The Antihelmintic activity of extract was comparable with Marketed allopathic drugs (Piperazine citrate (10 mg/ml), Albendazole (25 mg/ml, 50 mg/ml), Ivermectin (5 mg/ml), Levamisole (10 mg/ml). 2% v/v Tween 80 in water was taken as a normal control. Marketed allopathic drugs concentrations were prepared using 2% v/v Tween 80. Antihelmintic activity was evaluated by considering the time required for mobility, paralysis and death of worms by all the prepared extracts and marketed allopathic drugs concentrations.

Levamisole>Piperazine citrate>*Tephrosia purpurea* leaf extract>Ivermectin>Albendazole.

Key Words: *Tephrosia purpurea*, Antihelmintic activity, Earthworms.

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INTRODUCTION:

Helminthiasis is a worm infestation of humans and other animals even life stock and crops affecting health and food production respectively and has impact on global economic factor (Kumar, 2014). The worms which causes helminthiasis are called as helminths and the drugs which are used for treating helminthiasis are nothing but anthelmintics (Abongwa, 2017). There are various types of worms such as hook worms, fluke worms, round worms, tape worms which causes helminthiasis. The names are given according to their shapes. The major organs which get affected in helminthiasis are stomach and intestine and major symptoms of sever helminthiasis include diarrhea, abdominal pain, general malaise and impaired cognitive development. Chronic helminthiasis by hook worm lead to intestinal bleeding and anemia (Hedley, 2015). *Pheretima* is a genus of earthworms. *Pheretima posthuma* are long cylindrical shaped worms having length of 15-30cm. they are mostly found in moist soil and responsible for vegetables and humus. Their life span is 3 to 10 years (Kutschera, 2010) [1].

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 wounds [2].



Figure -1: *Tephrosia purpurea* plant

MATERIALS AND METHODS:

Collection of plant material:

The leaves of *Tephrosia purpurea* was identified and purchased from local market of hyderabad.

Preparation of extract:

The *Tephrosia purpurea* leaves were initially washed with water and then shade dried in sunlight for 3 days until leaves became completely dry. The dried leaves

were made into a fine powder by using a mechanical grinder. The collected powder was successively, extracted with ethanol by using Soxhlet apparatus. The extraction was carried out for 72 hrs at a temp not exceeding the boiling point of the solvent. Excess solvent was removed by the solvent evaporation to obtain the dry weight of the plant extracts.

Preliminary phytochemical screening: [3, 4, 5]

The preliminary phytochemical investigation was carried out with ethanolic extracts of leaves *Tephrosia purpurea* for identification of phytochemical constituents. Phytochemical tests were carried out by standard methods.

Test organism: [6]

Indian adult earthworms (*Pheretima posthuma*) were used during the experiment. The earthworms were collected from a local supplier. Worms were washed with normal saline to remove all fecal matter. The earthworms of 8-10 centimeter (cm) in length and 0.2 -0.5 cm width were used for all the experiment protocol. Ready availability, anatomical and physiological resemblance of (*Pheretima posthuma*) made it to be used initially for *in-vitro* evaluation of anthelmintic activity. Time for paralysis was noted either when any movement could not be observed except when the worms where shaken vigorously. Death was included when the worms lost their motility followed by white secretions and fading away of their body colour.

Evaluation of Anthelmintic activity: The anti-helmintic activity was evaluated on adult Indian earthworm. The earthworms were randomly chosen and divided into five groups having five earthworms in each as follows:

Group I: Ethanolic leaves extract of *Tephrosia purpurea* (EETP-25, 50,100 mg/ml)

Group II: Albendazole-25, 50, 100 mg/ml

Group III: levamisole-5, 10, 15 mg/ml

Group IV: Piperazine Citrate -5, 10, 15 mg/ml

Group V: Ivermectin- 5, 10, 15 mg/ml

Observations were made for the time taken by worms to paralyze and death was observed. Time for paralysis was noted when no movement could be observed with a slight pin prick method. Death was ascertained by applying external stimuli which stimulate and induce movements in worms as well as fade of the body color was noted [7].

Statistical analysis:

The values are expressed as mean \pm SEM. The statistical analysis was performed using one way analysis of variance (ANOVA) followed by Dunnett's multiple comparison test. Comparisons were made between test and marketed branded antihelmintic drugs. P-values <0.05 was considered

statistically significant. The statistical analysis was done by using Graph pad prism version no: 6.0.

RESULTS AND DISCUSSION:

In this study, we found that ethanolic extract of *Tephrosia purpurea* possess the following chemical constituents

Table-1: Phytochemical screening of ethanolic extract of *Tephrosia purpurea*

Phytochemical Constituents	Ethanol Extract of <i>Tephrosia purpurea</i>
Alkaloids	-ve
Flavonoids	+ve
Carbohyde	+ve
Saponins	+ve
Triterpenoids	+ve
Sterols	+ve
Tannins	+ve
Glycosides	+ve

+ Ve = Present, -Ve = absent

Table-2: Antihelmintic activity (time taken for paralysis& death of earthworm) by using EETP & Different marketed branded drugs

Type of Sample	Dose (mg/ml)	Time (min) taken for paralysis of earthworms Mean \pm S.E.M	Time (min) taken for death of earthworms Mean \pm S.E.M
Ethanolic Extract of leaves of <i>Tephrosia purpurea</i> [EETP]	25	49.000 \pm 2.309	72.667 \pm 0.667
	50	35.667 \pm 0.558	62.333 \pm 0.760
	100	35.667 \pm 0.558	40.000 \pm 1.033
Albendazole	25	80.667 \pm 1.944	87.867 \pm 0.860
	50	31.333 \pm 0.333	63.800 \pm 0.970
	100	15.665 \pm 1.243	31.985 \pm 0.546
Levamisole	5	23.332 \pm 0.146	16.833 \pm 0.792
	10	11.667 \pm 0.558	8.416 \pm 1.056
	15	7.778 \pm 0.143	5.610 \pm 0.583
Piperazine citrate	5	31.584 \pm 0.792	33.500 \pm 0.885
	10	15.500 \pm 0.671	16.758 \pm 1.025
	15	10.333 \pm 0.870	11.166 \pm 0.732
Ivermectin	5	33.167 \pm 1.014	53.333 \pm 0.803
	10	16.512 \pm 0.546	26.666 \pm 0.762
	15	11.241 \pm 1.768	17.789 \pm 0.526

**Figure -2: EETP [Ethanolic Extract of leaves of *Tephrosia purpurea*] -25mg/ml**

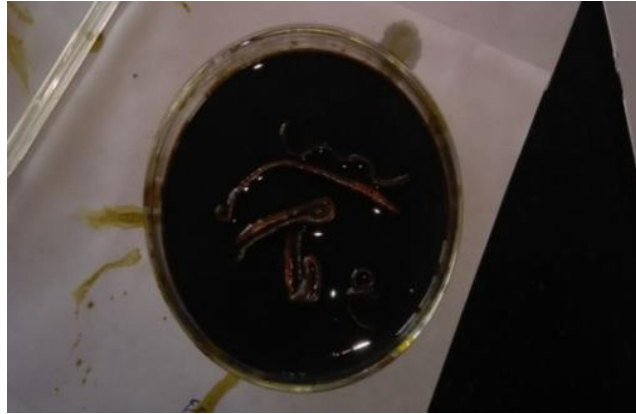


Figure -3: EETP [Ethanollic Extract of leaves of *Tephrosia purpurea*]-50mg/ml

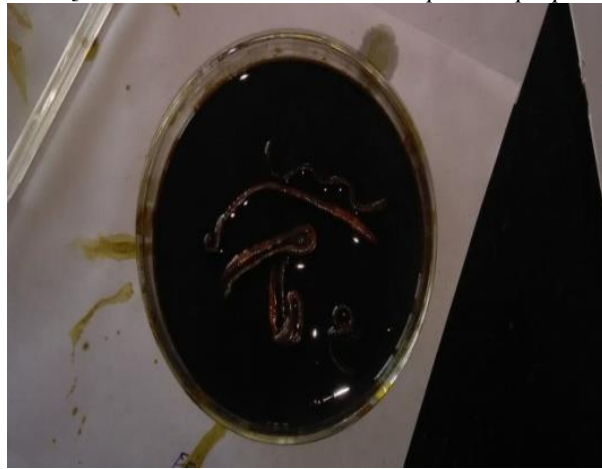


Figure -4: EETP [Ethanollic Extract of leaves of *Tephrosia purpurea*]-100mg/ml



Figure -5: Albendazole-100mg/ml



Figure -6: Levamisole -15mg/ml



Figure -7: Piperazine Citrate -15mg/ml



Figure -8: Ivermectin -15mg/ml

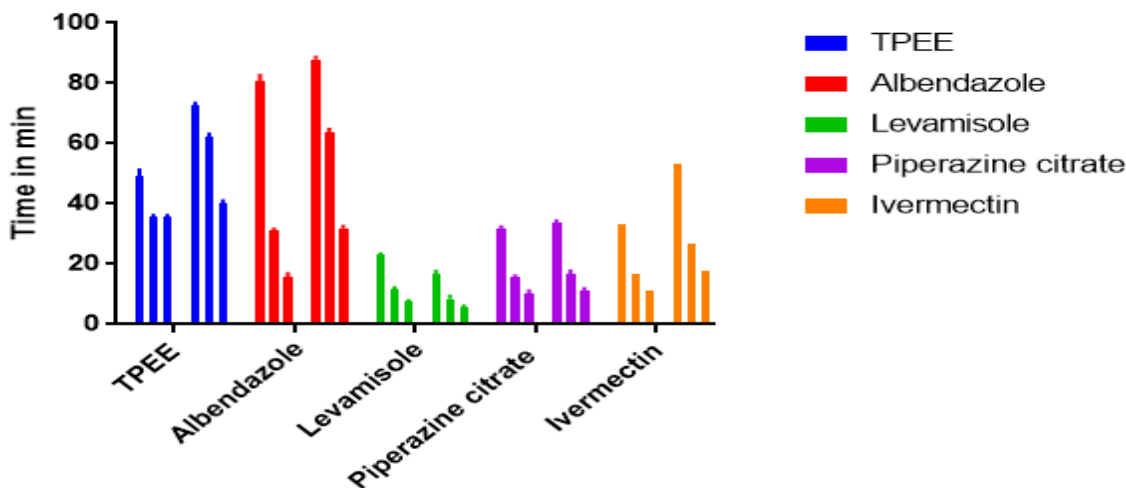


Figure -9: Graphical representation of time taken for paralysis& death of earthworm by using EETP & Different marketed branded drugs

CONCLUSION:

In the present investigation, ethanolic leaf extract of *Tephrosia purpurea* possess the presence of carbohydrate, proteins, amino acids, steroids, saponins, Flavonoids, alkaloids, tannins, glycosides and triterpenoids. Tannins, phenolic compounds and triterpenoids were shown to possess 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. These facts suggest that tannins present in the ethanolic extract of *Tephrosia purpurea*. showed the anthelmintic effect by above mentioned mechanisms. From the result shown in table-2 ethanolic extract of *Tephrosia purpurea* showed anthelmintic activity in dose dependent manner giving shortest time of paralysis and death with different marketed branded drugs. The study finally concluded

Levamisole>Piperazine citrate>*Tephrosia purpurea* leaf extract>Ivermectin>Albendazole.

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