



Research Article

EVALUATION OF ANTHELMINTIC ACTIVITY OF *STRYCHNOS POTATORUM* SEEDS

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ABSTRACT

The present study was designed to explore the anthelmintic activity of different extracts of seeds of *Strychnos potatorum* using petroleum ether, ethyl acetate methanol and water as solvents. Various concentrations (25 and 50mg/ml) of all the extracts were tested, which involved determination of time of paralysis and time of death of the worms. It was compared with Albendazole as standard reference and normal saline as control. The study indicated the potential usefulness of *Strychnos potatorum* against earthworm infections.

KEY WORDS: Anthelmintic activity, *Strychnos potatorum*, Albendazole

INTRODUCTION:

Helminthiasis is among the most important animal disease inflicting heavy production losses. The disease is highly prevalent particularly in third world countries¹ due to poor management practices. Chemical control of helminthes coupled with improved management has been the important worm control strategy throughout the world. However, increasing problems of development of resistance in helminthes² against anthelmintics have led to the proposal of screening medicinal

plants for their anthelmintic activity. The plants are known to provide a rich source of botanical anthelmintics³. A number of medicinal plants have been used to treat parasitic infections in man and animals⁴. *Strychnos potatorum* Linn (Fam: Loganiaceae) is a moderate sized tree found in southern and central parts of India, Sri Lanka and Burma⁵. The ripe fruit is emetic, diaphoretic, alexiteric, cures inflammation, anemia, jaundice⁶. The seeds are used in hepatopathy, nephropathy, gonorrhoea, leucorrhoea,

gastropathy, bronchitis, chronic diarrhoea, dysentery, renal and vesicle calculi, diabetes, burning sensation, dipsia, conjunctivitis, scleritis, ulcers and other eye diseases⁷. Phytochemical studies revealed the presence of diaboline (major alkaloid) and its acetate⁸, triterpenes and sterols⁹, mannogalactans¹⁰. The seeds are reported to have various activities like antidiabetic¹¹, antihypercholesterolemic activity¹², diuretic¹³, antidiarrhoeal¹⁴, hepatoprotective¹⁵ and antiulcer¹⁶. Although the seeds possess many potential therapeutic activities in traditional system of medicinal practice and possessing rich phytoconstituents, they are not evaluated for their pharmacological activities in detail. Literature review indicates that anthelmintic activity of this species has not been clinically evaluated so far. The present paper reports the anthelmintic activity of fruit extract of *Strychnos potatorum* against Earthworms.

MATERIALS AND METHODS:

Plant material:

The fresh leaves of *Strychnos potatorum* were collected from the local market, Kurnool (Dt) and authenticated by Botanist, Dr. P. Jayaraman, Plant Anatomical Research Centre (PARC), Tambaram, Chennai and the voucher specimen was kept in the Department of Pharmacognosy, Safa College of

Pharmacy, B.Tandrapadu, Kurnool, Andhra Pradesh, India.

Extraction of plant drug:

The collected seeds were washed, shade dried and converted into moderately coarse powder by mechanical grinder. The powdered material was extracted successively with petroleum ether (40-60°), ethyl acetate, methanol and water by using soxhlet apparatus. The solvent was removed under reduced pressure which yields different successive extracts in the form of semisolid mass.

Collection of worms:

Indian adult Earthworms (*Pheretima posthuma*) were collected from the moist soil near Safa College of pharmacy. Selected earthworms are 4-6 cm in length and 0.1-0.2 cm in width. The earthworms were washed with normal saline to remove all the faecal matter.

Preparation of test samples:

Test samples of the extract were prepared at the concentrations, 25 and 50 mg/ml in distilled water.

Anthelmintic Assay:

The anthelmintic activity was performed according to the method of Ghosh *et al*¹⁷ on adult Indian earthworm *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal round worm parasites of human beings. Twenty four earthworms were placed in petri dish and two different

concentrations (25 and 50 mg/ml) each of crude extract of petroleum ether, ethyl acetate, methanol and water were poured and observed for paralysis and death. The mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously and death was concluded when the worms lost their mortality followed with fading away of their body colour^{18,19}.

Statistical analysis:

The result were express as Mean ± SEM. Statistical analysis was carried out using one way ANOVA followed by Student-t test.

RESULTS AND DISCUSSION:

Anthelmintic activity of *Strychnos potatorum* is confirmed by examining the time taken for paralysis (P) and death (D) for *Pheretima posthuma* worms were reported in Table 1. As shown in Table 1,

methanolic extract of *Strychnos potatorum* exhibited anthelmintic activity in dose dependent manner taking shortest time for paralysis (P) and death (D) with 50mg/ml concentration. From the above results, it was observed that methanolic extract was more potent than the other three extracts (petroleum ether, ethyl acetate and water) even though chloroform and ethyl acetate extracts were not accomplished with anthelmintic property when compared with control and standard group. Thus, the activity revealed concentration dependence nature of the different extracts. It could be concluded that methanolic extract of *Strychnos potatorum* showed most potent anthelmintic activity. Further studies are required to identify the actual chemical constituents that are present in the crude extract of this plant which are responsible for anthelmintic activity.

Table 1: *In vitro* anthelmintic activity of various extracts of *Strychnos potatorum* seeds

| GROUPS | CONCENTRATION USED (mg/ml) | TIME TAKEN FOR PARALYSIS (min) | TIME TAKEN FOR DEATH (min) |
|-----------------------------------|----------------------------|--------------------------------|----------------------------|
| Control (Normal saline) | 25 | - | - |
| | 50 | - | - |
| Standard (Albendazole) | 25 | 21.75±1.552 | 29.61±0.524 |
| | 50 | 16.65±2.458 | 19.98±2.545 |
| Chloroform extract | 25 | 32.65±1.621 | 35.69±2.012 |

| | | | |
|------------------------------|----|-------------|--------------|
| | 50 | 32.52±2.561 | 31.61±2.643 |
| Ethyl acetate extract | 25 | 28.24±2.467 | 27.04±0.451 |
| | 50 | 24.03±1.429 | 22.75±0.913 |
| Methanol extract | 25 | 24.06±0.841 | 21.21±0.823 |
| | 50 | 20.26±0.146 | 19.25±0.628 |
| Aqueous extract | 25 | 30.12±1.452 | 52.14±1.491 |
| | 50 | 50.54±1.504 | 62.81± 2.214 |

Each value represents mean ± SEM (N=2) in each concentration and each groups.

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