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Extraction and Standardization of Anthelmintic Activity of *Solanum Xanthocarpum*

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ABSTRACT

Solanum xanthocarpum (*Solanaceae*) is distributed all over India and has been used by tribal as well as local people widely. Locally it is known as “Kantakari”. In present investigation the aim is to focus on the anthelmintic activity of this valuable medicinal plant *Solanum xanthocarpum*. Helminthiasis is a worldwide and one of the common diseases of all ages. As per WHO more than two billion people harbor this infection. From the survey of WHO only few drugs are frequently used in the treatment of helminthes in human, due to the cost and the development of resistance against these drugs. In the present work the alcoholic and aqueous extracts of *Solanum xanthocarpum* were evaluated for its anthelmintic activity against adult earthworms (*Phertima prosthuma*). The activities of the extracts were compared with standard Albendazole. Both the extracts and standard were prepared in saline water. The alcoholic and aqueous extract showed significant anthelmintic activity and it was found that the aqueous extract activity is higher than alcoholic extract.

Keywords: *Solanum xanthocarpum*, Anthelmintic activity, *Phertima prosthuma*, albendazole

1. INTRODUCTION

The whole plant of *Solanum xanthocarpum* is used for medicinal purpose. It is known as Indian night shade or yellow berry plant. It has an important place in medicinal herbs, especially in India since ancient times. The plant commonly found in India, often in waste places, on roadsides and in open space. The leaves are up to 10 cm in length, their midribs and other nerves with sharp yellow prickles. The flowers are purple in nature, about 2 cm long found has small bunch opposite to the leaves. The fruits are glabrous, globular drooping berries. A glucoalkaloid termed solanocarpine is found in the fruits. A sterol known as carpesterol and solanocarpidine are also present. Potassium nitrate, a fatty acid, a resinous and phenolic substance, diosgenin and sitosterol are present. Kantakari is bitter and pungent in taste and has hot potency. Kantakari is useful in wide range of diseases. It is more commonly used in the diseases like bronchial asthma, cough, worms etc. It facilitates the seminal ejaculation, alleviate worms, itching, and fever and reduce fats. The paste applied on swollen and painful joints in arthritis, reduces the pain and swelling effectively¹⁻⁴.

2. MATERIALS AND METHODS

The fruits of *Solanum xanthocarpum* were collected from wild area of Bhopal, near bhadbhada dam. The plant fruits were collected in month of July. The collected plant materials were botanically identified and confirmed by botanist at Dr Hari Singh Gour University Sagar (M.P.).

2.1 Preparation of aqueous extract

The dried powdered of plant (70 gm) were extracted with water. The drug was extracted for 72 hrs. After that filtered the extract and dried on water bath. The percentage yield of aqueous extract was 3 % w/w.

2.2 Preparation of ethanolic extract

A weighed quantity of dried powdered of plant (70 gm) subjected to hot solvent extraction in a soxhlet apparatus (50 cycles per each batch) using ethanol (95 %), at a temperature range of 55°C to 65°C. The filtrate was evaporated to dryness at 40°C under reduced pressure in a rotary vacuum evaporator. The percentage yield of ethanolic extract was 5 % w/w.

2.3 Animal

The Indian earth worm *Pheretima Posthuma* was used to study anthelmintic activity. The earth worms are collected and washed with normal saline with removal of fecal matter. The earth worms are 5 to 6 cm length and 0.2-0.3 cm width were used for all experimental protocol^{5,6}.

2.4 Evaluation of Anthelmintic activity

Aqueous and ethanolic extracts of *Solanum xanthocarpum* were examined systematically for their anthelmintic activity against *Phertima posthuma*. The Anthelmintic activity was determined by the method followed by Gaiind and Budhiraja⁷. The assay was performed on adult earthworm, because of to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro⁸.

For the anthelmintic study adult earthworms (*Pheretima Posthuma*) were collected from moist soil and washed with normal saline to remove all dirty matter and six earthworms were placed in each petridish. The suspensions of extracts were prepared in normal saline in different concentration like Albendazole (5mg/ml, 10mg/ml, 15 mg/ml, 20mg/ml), aqueous extract (5mg/ml, 10mg/ml, 15 mg/ml, 20mg/ml) and ethanolic extracts (5mg/ml, 10mg/ml, 15 mg/ml, 20mg/ml) of *Solanum xanthocarpum*. These extracts were tested in the bioassay, which involved for the determination of time of paralysis and time of death of the worms. The time taken by the worms to become motionless, considered as paralysis was recorded and the lethal time was recorded by observing the time taken to become motionless on application of external stimuli by pricking with pin^{9,10}.

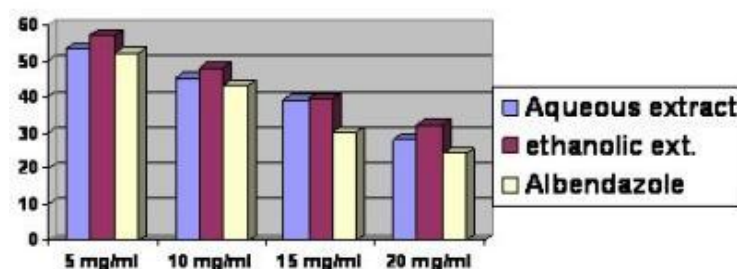


Fig 1: Anthelmintic Activity of *Solanum xanthocarpum* Extract (Death Time)

Table No 1: Anthelmintic activity of the extracts of *Solanum xanthocarpum*

S. No.	Treatment	Conc. (mg/ml)	Paralysis Time (min.)	Death Time (min.)
1.	Aqueous extract	20	20.08± 0.90	28.11± 0.26
		15	32.18± 0.64	42.12± 0.09
		10	33.12± 0.45	45.32± 0.63
		5	40.19± 0.2	53.48± 0.5
2.	Ethanolic extract	20	24.19± 0.5	32.4± 0.8
		15	31.12± 0.4	39.5± 0.1
		10	35.33± 0.1	48.15± 0.60
		5	41.55± 0.1	57.20± 0.12
3.	Standard Drug (Albendazole)	20	18.10± 0.4	24.21± 0.60
		15	23.60± 0.45	30.25± 0.4
		10	28.54± 0.09	43.22± 0.90
		5	37.21± 0.12	52.17± 0.46

3. RESULT AND DISCUSSION

The result showed in Table No 1 and Fig 1. It was observed that the aqueous extract is more potent than ethanolic

extract even through both the extract are endowed with significant anthelmintic property against the adult earth worm (*Pheretima Posthuma*) as compared to Albendazole especially at higher concentration. The activity reveals the concentration dependence nature of different extract. Potency of extract was found to be inversely proportional to the time taken for paralysis/death of the worm. The activity was compared with the aqueous and ethanolic extract.

4. CONCLUSION

Based on the results we can suggested that the anthelmintic effect of aqueous extract as well as ethanolic extract, is related to the possible presence of alkaloid and tannins in the extract. The present study justifies the folkore claims of its Anthelmintic property. It would be interesting to isolate the possible constituents those are responsible for such activity.

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