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Available online at: www.jparonline.com**Solanum surattense: Evaluation of anthelmintic activity**

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ABSTRACT: Background: As per Folklore, the *Solanum surattense* fruits possess several pharmacological activities like Analgesics, Anthelmintics, Andidiabetic and Antidiarrhoeal. The up to date scientific study showed that no such significant scientific studies have done on such plant. **Aim:** The present study is aimed to explore the anthelmintic activity of aqueous and ethanolic extract of fruits of plant *Solanum surattense*. **Methods:** The fruits of *S. Surattense* are extracted by Soxhlation using water and ethanol. The anthelmintic activity of aqueous and ethanol extract was evaluation by using Indian earthworm at doses of 10, 15, 20 and 25 mg/ml. The albendazole was used as standard drug (10 mg/ml). The paralysis and death time of earthworm after administering doses were determined. **Results:** The fruit extracts showed anthelintic activity in dose dependent manner. Aqueous extract exhibited better activity than ethanol extract. The anthelmintic activities of all extracts were comparable and showed better activity than that of the standard drug Albendazole, which justifies its activity. **Conclusion:** The result showed that the ethanolic fruits extract of *Solanum surattense* exhibited greater anthelmintic activity that aqueous extract.

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INTRODUCTIONS:

The Indian medicines are set out in the sacred writings called the Vedas, especially in the metrical passages of the Atharvaveda, which may possibly date as far back as the 2nd millennium BC. According to a later writer, the system of medicine called Ayurveda was received by a certain Dhanvantari from Brahma, and Dhanvantari was deified as the god of medicine^[1,2]. The Indian system of medicine and homeopathy including Ayurveda, Siddha, Unani and drugless therapies such as Yoga and Naturopathy are widely practiced in India. Apart from above, Allopathic system of medicine is another approach of treatment of diseases but having lesser popularity due to its poor biological system adaptability

[3,4]. Herbal medicines are being used by about 80% of the world population primarily in the developing countries for primary health care. The advantages of using herbal medicines are safety, efficacy, cultural acceptability and lesser side effects [4].

The *S. surattense* belongs to family *Solanaceae*, called as yellow berried or nightshade (English), kantakari (Sanskrit), nelamulaka (Telgu), bhejibaugana (Oriya), kandangatri (Tamil) and Kateli (Hindi). Flowers are in cymes. Calyx tube is short, globose and lobes linear-lanceolate, acute, densely hairy and prickly (Fig 1). Corolla purple, lobes deltoid, acute, and hairy outside. Another filament is long, glabrous and anthers open by pores. Ovary is ovoid and glabrous. Berry yellow, green- blotched and surrounded by enlarged calyx. Seeds are glabrous [5,6].

Panchang (whole herb including roots) and berries, have anthelmintic property, useful in bronchitis, asthma, fever relieving, thirst and given in urinary concretions. The leaves have good application for piles. The fruit is laxative. Fumigations with the vapour of the burning seeds of this plant are found useful for the cure of toothache [7].



Fig 1. *S. surattense* whole plant.

MATERIALS AND METHODS:

Collection and identification of plant:

The fruits of *S. surattense* were collected from local area of Salipur, of Cuttack district (India) in the month of January and February 2018. Generally the fruits will come out of plant after saddling of leaves. The fruits were collected by plugging directly from the tree. The fruits were collected in matured form that is almost ripped form. Around 3 to 3.5 kg of fruits were collected with the help of local people.

Extraction of phytoconstituents from fruits:

The chemical constituent of fruits was extracted by percolation method. The fruits were soaked in distilled water, shaken for 4 to 5 h and filtered. The filtrate was gently heated in heating mantle at 45°C to get a concentrated viscous solution. The viscous solution thus obtained was passed through muslin cloth. The coagulated mass was dried in hot air oven at 40-50°C for 2 to 3 h. The dried product was grinded, powdered and passed through sieve (Sieve no 80). The obtained aqueous extract powder was stored in an air tight container. The ethanolic extract was obtained by treating the above aqueous mucilage with 95 % ethanol in the ratio 1:1 with continuous stirring. The coagulated mucilage was transferred to an evaporating disc. It was treated successively with ethanol. The coagulated mass was dried in hot air oven at 40-50°C for 2 to 3 h. The dried product was grinded, powdered and passed through sieve (Sieve no 80). The obtained ethanolic extract powder was stored in an air tight container [8,9].

Evaluation of Anthelmintic activity:

Biological study:

Healthy adult Indian earthworms, *Pheretima postuma*, due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings were used in the present study. All earthworms were of approximately equal size. They were collected from local place, washed and kept in water [10,11].

Drugs:

The ethanolic extract of *Solanum surattense*. The doses are 10, 15, 20 and 25 mg/ml tested in each group. Normal saline water was used as control. Albendazole were used as the standard drugs.

Experimental method:

Earthworms were divided into fifteen groups (5 each). The first group (I) served as normal control which received saline water only. The second (II) group received the standard drugs Albendazole at a dose level of 10 mg/ml. Groups (III) to (VI) received doses of aqueous extracts of 10, 15, 20 and 25 mg/ml respectively. Groups (VII) to (X) received doses of ethanolic extracts of 10, 15, 20 and 25 mg/ml respectively. Observations were made for the time taken to cause paralysis and death of individual worms for 2 h. Paralysis was said to occur when the worms do not revive even in normal saline water. Death was concluded when the worms lost their motility followed with fading away of their body colors [12-15].

RESULTS AND DISCUSSIONS:

The unripe fruit extracts of *Solanum surattense* produced a significant anthelmintic activity in dose dependent manner as shown in Table 3. The anthelmintic activities of all extracts were comparable with that of standard drug albendazole (Fig 2). The normal saline water was used as a control. No symptoms of paralysis and death of earth worms were observed in normal saline water. The anthelmintic activity of both aqueous and ethanolic extract was comparable with that of standard drug Albendazole. The extent of activity shown by the crude extracts was found to be better than that of the standard drug Albendazole, which justifies its activity. The result showed that the ethanolic extract of fruits *Solanum surattense* exhibited greater anthelmintic activity than aqueous extract.

Table 1. Anthelmintic activities of fruits extracts of *S. surattense* against *P. posthuma*.

Groups	Dose	Conc (mg/ml)	PT (min)	DT (min)
I	NSW	-	No	No
II	STD	10	64.2	71.4
III	AE	10	39	51
IV	AE	15	35	42
V	AE	20	29	36
VI	AE	25	22	28
VII	EE	10	43	54
VIII	EE	15	39	47
IX	EE	20	31	38
X	EE	25	25	32

Group I – Control (NSW-Normal saline water), group II – Standard (Albendazole), groups IV -VI – Aqueous and groups VII and X – Ethanolic extract at 10, 15, 20 and 25 mg/ml.

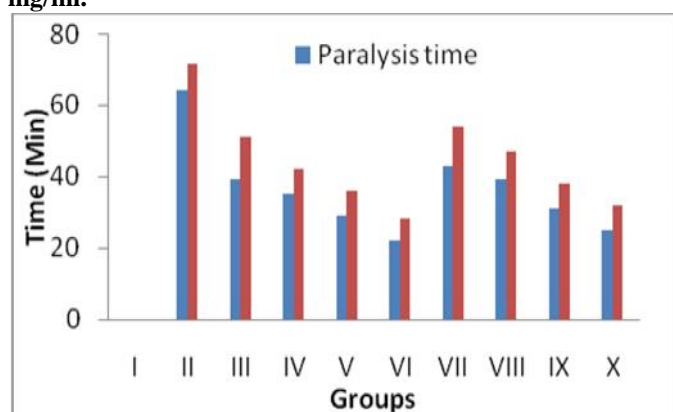


Fig 2. Anthelmintic activities of fruit extracts of *S. surattense* on Indian Earthworms.

Group I – Control (NSW), group II – Standard (Albendazole), groups IV -VI – Aqueous and groups VII and X – Ethanolic extract at 10, 15, 20 and 25 mg/ml.

CONCLUSION:

Solanum surattense is having anthelmintic activity. Aqueous extract showed better anthelmintic activity in comparison to the ethanolic extract of fruits of *Solanum surattense*. Further studies are required to identify the actual chemical constituents that are present in the crude extracts of this plant which are responsible for anthelmintic activity.

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REFERENCES:

1. The Ayurvedic Pharmacopoeia of India, Part I, Vol. I, Government of India Ministry of Health and Family Welfare; 2004. pp. 77-78.
2. Gupta G and Dutt S. Herbal Monograph. J. Indian Chem. Soc. 1936;13:663-67.
3. Thorn GW, Adams RD, Braunwald E, Isselbacher KJ, Petersdorf RG. Harrison's Principles of Internal Medicine. New York: McGraw Hill Co; 1977. pp. 248-256.
4. Tagbota S, Townson S. Antiparasitic properties of medicinal and other naturally occurring products. Adv Parasitol, 2001; 50: 199-205.
5. Bundy DA. Immunoepidemiology of intestinal helminthic infection I: The global burden of intestinal nematode disease. Trans Royal Soc Trop Med Hyg, 1994; 8: 259-261.
6. Perry BD, Randolph TF, McDermott JJ, Sones KR, Thornton PK. Investing in Animal Health Research to Alleviate Poverty. Nairobi: International Livestock Research Institute (ILRI); 2002. pp. 148 - 149.
7. Vigar Z. Atlas of Medical Parasitology. 2nd ed. Singapore: Publishing House; 1984. pp. 114-118.
8. Chatterjee KD. Parasitology, Protozoology and Helminthology. 6th ed. Calcutta: Guha Ray Sree Saraswati Press Ltd.; 1967. pp. 229-232.
9. Shekhawat N, Vijayvergia R. Anthelmintic Activity of Extracts of Some Medicinal Plants. Int J Computational Sci Mathe, 2011; 3(2): 83-87.
10. Devi VR. Anthelmintic Activity of Plants: A Review. Res J Phytochem, 2014; 8(3): 57-63.
11. Tadesse E, Mirutse G. *In vitro* anthelmintic activity of three medicinal plants against *Haemonchus contortus*. Int J Green Pharmacy, 2008; 2(3): 29-34.

12. Ajaiyeoba EO, Onocha PA, Olarenwaju OT. *In vitro* anthelmintic properties of *Buchholzia coriacea* and *Gynandropsis gynandra* extract. Pharm Biol. 2001; 39: 217-220.
13. Vidyarthi RD. A Textbook of Zoology. 14th ed. New Delhi: Chand and Co. Press; 1977. p. 329-31.
14. Thorn GW, *et al.* Harrison's Principles of Internal Medicine. New York; Mc Grew Hill; 1977. p. 1088-90.
15. Vigar Z. Atlas of Medical Parasitology. 2nd ed. Singapore: Publishing House; 1984. p. 216-18.

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