

Anthelmintic Activity of the Extracts of *Solanum xanthocarpum* Schrad and Wendl fruits (Solanaceae)

Gunaselvi.G.^{1*}, Kulasekaren.V^{2.}, V. Gopal^{3.}

Department Of Pharmacognosy, College of pharmacy, Mother Theresa Post Graduate and Research Institute of Health Sciences, Gorimedu, Pondicherry, India

*Corres. author: gunampharm27@gmail.com

Abstract: 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 turned the attention of many researchers towards the evaluation of medicinal plants. After the successful research work of many scientists, the natural sources play a key role in the treatment of the anthelmintic. With the view of anthelmintic activity, various extracts from the fruits of *Solanum xanthocarpum* is prepared and out of it methanolic and aqueous extracts of the fruits shown the amazing anthelmintic activity of parasite.

Key words: *Solanum xanthocarpum*, *Pheretima Posthma*.

Introduction

Solanum xanthocarpum is known as Indian night shade or yellow berried night shade plant⁽²⁾. The Common name is Kantakari, synonym *Solanum surattense* and it belongs to family *Solanaceae*. It plays an important place among medicinal herbs, (especially, for the treatment of cough) especially in India since ancient times. The plant found well versed in India, often in waste places, on roadsides and in open space. It is usually spreading or diffused perennial, woody at base. The young branches are densely covered with star-shaped hairs. The zig-zag branches, and covered with yellow, sharp, shining prickles. 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, 1.5-2 cm, yellow or pale with green veins. Kantakari is bitter and pungent in taste and has hot potency. It possesses light and dry attributes. Kantakari is useful in wide range of diseases. It is more commonly used in the diseases like bronchial asthma, cough, worms etc. The fruits facilitate the seminal ejaculation, alleviate worms, itching, and fever and reduce fats. The whole plant is used for medicinal purpose including of fruits

and roots. The powder form of kantakari with oils is mixed well and used externally to alleviate nasal disorders. And also, nasal administration of kantakari is beneficial in migraine, asthma and headache. The dried fruits are smoked in the form of cigarette and the smoke held up in the mouth cavity for some time ameliorates the dental infections. The fumigation of kantakari is helpful in piles. The paste applied on swollen and painful joints in arthritis, reduces the pain and swelling effectively. The powder form of the fruits with honey relieves chronic cough in children. Juice extracted from the fruit is used to treat sore throats and the vapours of the burning seeds have been used to relieve toothache. 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. Dry fruits contain traces of isochlorogenic, neochronogenic, chronogenic and caffeic acids. Solasodine, solasonine, solamargine and solamargine are present in fruits of Nepalese plant. Quercetin isolated together with apigenin and sitosterol⁽¹⁾. The flavanoids quercitrin and apigenin glycosides are the major chemical constituents which are present in the fruits of *Solanum xanthocarpum*. The literature survey shows

that no reports were found on the anthelmintic activity of the fruits extracts of *Solanum xanthocarpum*.

Material and methods

The fruits of *Solanum xanthocarpum* were Collected from lawspet, Puducherry and the collected plant materials were botanically identified and confirmed by Taxonomist, Bio-Science Research Foundation, Pondicherry. The herbarium specimen was prepared and preserved in Department of Pharmacognosy, MTPG&RIHS, and Puducherry.

Preparation of the Extracts

The collected fruits were made in to small pieces separately, shade-dried, and coarsely powdered using a pulverizor. The coarse powders were subjected to successive extraction with water by distillation method and with ethanol by Soxhlet method⁽³⁾. The extracts were collected and distilled off on a water bath at atmospheric pressure and the last trace of the solvents was removed *in vacuo*. The prepared extracts were used for screening of anthelmintic activity.

Animal

The Indian earth worm *Pheretima Posthma* 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 6cm length and 0.2- 0.3cm width were used for all experimental protocol^(4, 5).

Requirements

Piprezine citrate, Ethanolic extract, Normal saline, Aqueous extract, *Pheretima Posthma* (Earth worms), Petri dish

Experimental

Ethanollic & aqueous extracts that were prepared from fruits of *Solanum xanthocarpum* were examined systematically for their anthelmintic activity against *Phertima Posthma*. The anthelmintic assay procedures

were carried out as per the method of Ajaiyeoba et al.⁽⁶⁾ with slight modifications⁽⁷⁾. The assay was performed on adult Indian earthworm, because of to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings^(8, 9, 10, and 11). Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds *in vitro*^(12, 13, 14, 15, 16, 17).

For the anthelmintic study Indian adult earthworms (*Pheretima Posthuma*) were collected from moist soil and washed with normal saline to remove all fecal matter. The earth worms were placed in petridishes containing normal saline, piprezine citrate(25mg/ml,50mg/ml,100mg/ml),aqueous extract (25mg/ml,50mg/ml,100mg/ml) and ethanolic extracts (25mg/ml,50mg/ml,100mg/ml)of *Solanum xantho - carpum* fruits 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.

Result and discussion

The aqueous and ethanolic extracts of *Solanum xanthocarpum* produced paralysis as well as death of worms in a less time as compared to piprezine citrate especially at higher concentration of 100mg/ml. The results of both these extracts confirm the anthelmintic activity against the Indian earth worm (*Pheretima Posthuma*).

Conclusion

The anthelmintic activity of *Solanum xanthocarpum* has been confirmed with fruity extract of this herbal plant and further studies need to be carried on to find the active constituents which responsible for anthelmintic activity.

Table no: 1: Anthelmintic activity of the extracts of *Solanum xanthocarpum* fruits

DRUG	CONCENTRATION(mg/ml)	TIME IN MINUTES	
		PARALYSIS	DEATH
Piprezine citrate	25	1.32 ± 0.90	49.3 ± 0.26
	50	0.75 ± 0.64	25.2 ± 0.09
	100	0.50 ± 0.45	15.6 ± 0.63
Aqueous extract	25	10.8 ± 0.2	83 ± 0.5
	50	8.2 ± 0.5	69 ± 0.8
	100	6.2 ± 0.4	55 ± 0.1
Ethanolic extract	25	9.34 ± 0.1	71 ± 0.60
	50	5.15 ± 0.1	66 ± 0.12
	100	3.55 ± 0.7	33 ± 0.45
Control	-	-	-

References

1. Herbalcure India, World's Premier Health Information Site.
2. Planet Ayurveda, Holistic Healing Through Herbs, Krishna.
3. Harborne, J.B. Phytochemical Methods: A Guide To Modern Techniques Of Plant Analysis, 1998, 3rd Ed. London: Chapman And Hall.
4. Nirmal Sa, Malwadkar G, Laware Rb. Anthelmintic Activity Of *Pongamia Glabra*. *Songlanakar J Sci Technol* 2007;29:755-7.
5. Anthelmintic Activity Of *Ficus Benghalensis*, Manoj Aswar, Urmila Aswar, Bhagyashri Watkar Et Al., *International Journal Of Green Pharmacy*, 2008, July – September.
6. Ajaiyeoba EO, Onocha PA, Olarenwaju OT. In Vitro Anthelmintic Properties Of *Buchholzi Coriaceae* And *Gynandropsis Gynandra* Extract. *Pharm Biol* 2001, 39:217-20.
7. Deore S.L. Et Al /Int.J. Chemtech Res.2009,1(2) 178
8. Vidyarthi RD. A Text Book Of Zoology. 14th Ed. New Delhi: S. Chand And Co; 1967.
9. Thorn GW, Adams RD, Braunwald E, Isselbacher KJ, Petersdorf RG. *Harrison's Principles Of Internal Medicine*, 1977, New York: McGraw Hill Co;
10. Vigar Z. *Atlas Of Medical Parasitology*. 1984, 2nd Ed. Singapore: P.G. Publishing House.
11. Chatterjee KD. *Parasitology, Protozoology And Helminthology*. 6th Ed. Calcutta: In Guha Ray Sree Saraswaty Press Ltd; 1967.
12. Sollmann T. Anthelmintics: Their Efficiency As Tested On Earthworms. *J Pharmacol Exp Ther* 1918; 12:129-70.
13. Jain ML, Jain SR. Therapeutic Utility Of *Ocimum Basilicum* Var. *Album*. *Planta Med* 1972; 22:66-70.
14. Dash GK, Suresh P, Kar DM, Ganpaty S, Panda SB. Evaluation Of *Evolvulus Alsinoids* Linn. For Anthelmintic And Antimicrobial Activities. *J Nat Rem* 2002; 2:182-5.
15. Szewezuk VD, Mongelli ER, Pomilio AB. Antiparasitic Activity Of *Melia Azadirach* Growing In Argentina. *Molecular Med Chem* 2003; 1:54-7.
16. Shivkar YM, Kumar VL. Anthelmintic Activity Of Latex Of *Calotropis Procera*. *Pharma Biol* 2003; 41:263-5.
17. In Vitro Anthelmintic Activity Of *Cassia Tora* Deore S. L.*, S.S.Khadabadi, Kamdi K. S., Ingle V. P., *International Journal Of Chemtech Research*, CODEN(USA): IJCRGG ISSN : 0974-4290, 2009, Vol.1, No.2, Pp 177-179, April-June.
