



ISSN: 0975-766X

Research Article

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ANTHELMINTIC ACTIVITY OF ANNONA SQUAMOSA SEED EXTRACT

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Received on 29-01-2011

Accepted on 15-02-2011

Abstract

The aim of the present study was to investigate the anthelmintic activity of the *Annona squamosa* (Annonaceae), seed extract using adult earthworm, *Pheritima posthuma*. The methanolic extract of the crude drug at concentrations of 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml were tested which involve determination of paralysis time and death time. Albendazole was used as standard and it was found that the concentrated methanolic extract of the *Annona squamosa* seed which is mostly seen in South India showed anthelminthic activity.

Keywords: Anthelmintic activity, Albendazole, Earthworm, *Annona squamosa*.

Introduction

Anthelmintics or antihelminthics are the drugs or the agents that destroy or cause the expulsion of parasitic intestinal worms. Helminthiasis is a macroparasitic disease of humans and animals in which a part of the body is infested with parasitic worms such as pinworm, roundworm, or tapeworm. It can have immunomodulatory effects on the host, with implications for any co infecting pathogens¹. More than half of the population of the world suffers from infection of one or the other and majority of cattle's suffers from worm infections. Gastrointestinal parasitism of sheep and goats is one of the leading causes of mortality, producing high economic losses². This infection can be controlled with chemical medicinal agents but improved management is the most important infection control strategy throughout the world. 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 helminths^{3,4} 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 anthelmintics^{5,6}. A number of medicinal plants have been used to treat parasitic infections in man and animals^{7,8}. Albendazole is the first drug of choice for the treatment of worm infections. It is also first reported anthelmintic which promises to have useful activity against all the types of helminth parasites menacing the domestic animals⁹. We have focused our attention on search of herbal remedy and selected *Annona squamosa*, the sugar apple that grows in tropical countries.

Material and Methods

Literatures of many research works prove that every part of *A.squamosa* possess medicinal property¹⁰. Roots are employed internally in spinal diseases. Bark is known to be a powerful astringent. In Ayurveda, fruits are considered as a good tonic; enriches blood, used as expectorant, increases muscular strength; cooling, lessens burning sensation and tendency to biliousness; sedative to heart and relieves vomiting. Ripe fruit along with salt is used against malignant tumors to hasten suppuration. Dried unripe fruit is powdered and mixed with gram-flour to destroy vermin. The seeds are said to be abortifacient and good to destroy lice in hair in Yunani medicine. Seed yields oil and resin which acts as detergent and their powder, is mixed with gram-flour, is a good hair wash. Seeds are powerful irritant of conjunctiva and produce ulcers in the eye. Leaves are used as poultice over boils and ulcers and also to kill lice^{11, 12, 13, 14}. It is also reported that 5% (w/w) ointment of alcoholic extract of dried leaves in white petroleum jelly is used in wound healing¹⁵.

Collection of Plant Materials

The seeds of *Annona squamosa* were obtained from the local agricultural market which were authenticated and confirmed by Ms. K. Chaitanya Sravanthi, Head of Department - Pharmacognosy, Vignan Institute of Pharmaceutical Sciences, Hyderabad. The seeds were crushed and powdered into a coarse powder.



Fruit



Seeds

Fig 1: Annona squamosa

Preparation of Extract

Approximately 250gm of the Annona squamosa powder was taken in 1lt beaker and soaked in sufficient quantity of methanol and macerated for 72 hrs. The methanolic extract obtained was filtered and distilled to obtain a concentrate of 12gm.

Experimental Model

Adult earthworm *Phertima posthuma* were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being^{16, 17}) from moist soil, obtained from agricultural fields nearby Vignan hills, Deshmukhi, A.P.-India. Three test groups were taken each containing six earth worms of approximately equal size (8 ± 1 cm). Albendazole was taken as standard drug and different concentrations (10mg/ml, 20mg/ml, 30mg/ml and 40mg/ml) were prepared in normal saline containing 5% DMF^{18, 19, 20}. The methanolic *Annona squamosa* seed extract of different concentrations were prepared by dissolving in minimum quantity of DMF and making up to the final volume with normal saline to obtain 10mg/ml, 20mg/ml, 30mg/ml and 40mg/ml concentrations. One of the groups is taken as control group which was treated with normal saline containing 5% DMF. Paralysis onset time and death time of individual worms were noted. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed by fading away of color of worm.

Results and Discussion

The data in Table-1 reveals that the methanolic seed extract of the *Annona squamosa* showed significant anthelmintic activity compared to the standard.

Table-1: Anthelmintic activity of methanolic *annona squamosa* seed extract.

S. No.	Test group	Concentration (mg/ml)	Paralysis onset time (min)	Death time (min)
1.	Control	-	-	-
2.	Methanolic <i>Annona squamosa</i> seed extract	10	21.84 ± 0.82	79.76 ± 0.84
		20	8.94 ± 0.43	47.22 ± 0.81
		30	6.04 ± 0.74	38.73 ± 0.58
		40	4.49 ± 0.24	30.15 ± 0.64
3.	Albendazole	10	7.15 ± 0.42	74.33 ± 0.84
		20	5.33 ± 0.32	32.43 ± 0.83
		30	1.42 ± 0.18	29.99 ± 0.32
		40	1.1 ± 0.05	26.67 ± 0.92

Results are expressed as mean ± SEM from six observations; Control worms were alive up to 24 hrs of observation

CONCLUSION

Annona squamosa seed extract was effective at all concentrations tested against the Standard drug, Albendazole in causing the death of earthworms.

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