



ISSN: 0975-766X

Research Article

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ANTHELMINTIC ACTIVITY OF SAPINDUS TRIFOLIATUS SEED EXTRACT

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Received on 28-01-2011

Accepted on 10-02-2011

Abstract

The aim of the present study was to investigate the anthelmintic activity of the seeds of *Sapindus trifoliatus*, family, Sapindaceae 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 *Sapindus trifoliatus* seed which is mostly seen in South India showed anthelminthic activity.

Keywords: Anthelmintic activity, Albendazole, Earthworm, *Sapindus trifoliatus*.

Introduction

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. This infection is highly prevalent particularly in third world countries¹ due to poor management practices. Typically, the worms reside in the gastrointestinal tract but may also burrow into the liver or other organs. Helminthiasis can have immunomodulatory effects on the host, with implications for any co infecting pathogens². 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. 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. Anthelmintics or antihelminthics are the drugs or the agents that destroy or cause the expulsion of parasitic intestinal worms. Treatment with an anthelminthic drug kills worms whose genotype renders them susceptible to the drug. Worms that are resistant survive and pass on their "resistance" genes. Resistant worms accumulate and finally treatment failure occurs⁵. The plants are known to provide a rich source of botanical anthelmintics^{6,7}. A number of medicinal plants have been used to treat parasitic infections in man and animals^{8,9}. Intestinal worm infections in general are more easily treated than those in other locations in the body. Because the worms need not be killed by the drug and the drug need not be absorbed when given by mouth, there is usually a wider margin of safety than with drugs for worm infections in other sites¹⁰. 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 animals¹¹. We have focused our attention on search of herbal remedy and selected *Sapindus trifoliatus*, the Soap nut tree that grows in South India.

Material and Methods

Sapindus trifoliatus is reported to have anti inflammatory¹², antinociceptive¹³, anti migraine¹⁴. Traditionally, *Sapindus trifoliatus* is used intranasally to treat migraine¹⁵. Their fruits and seeds are slightly smaller than the North Indian soap nuts. The shell is of a red colour and become darker after they are harvested and dried. The tree grows up to a height of 12 meters. Flowering and fruiting occurs between the months of October to January.

Collection of Plant Materials

The fruits of *Sapindus trifoliatus* were collected from the local market which were authenticated and confirmed by Ms. K. Chaitanya Sravanthi, Head of Department - Pharmacognosy, Vignan Institute of Pharmaceutical Sciences, Hyderabad. The pericarp of the fruit is removed by crushing in mortar and pestle with minimum

pressure and the seeds were collected. Seeds after collection were crushed and powdered into a coarse powder using mortar and pestle.



Sapindus trifoliatus fruits on the tree



Sapindus trifoliatus fruits



Sapindus trifoliatus seeds

Fig 1: Sapindus trifoliolate

Preparation of Extract

Approximately 240gm of the Sapindus trifoliatus 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 15gm.

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 *Sapindus trifoliolate* 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 *Sapindus trifoliatus* showed significant anthelmintic activity compared to the standard.

Table-1: Anthelmintic activity of methanolic *sapindus trifoliatus* seed extract.

S. No.	Test group	Concentration (mg/ml)	Paralysis onset time (min)	Death time (min)
1.	Control	-	-	-
2.	Methanolic <i>Sapindus trifoliatus</i> seed extract	10	14.8 ± 0.42	107.3 ± 0.73
		20	13.7 ± 0.22	97.22 ± 0.68
		30	11.58 ± 0.75	47.2 ± 0.98
		40	5.17 ± 0.17	28.22 ± 0.94
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

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

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