



**ANTHELMINTIC ACTIVITY OF METHANOLIC EXTRACT OF
SPHAERANTHUS AMARANTHOIDES BURM**

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ABSTRACT

The objective of this study was to evaluate the anthelmintic activity of methanolic extract of *Sphaeranthus amaranthoides*. Three concentrations (25 µg/ml, 50µg/ml, 100 µg/ml) of extract were studied in activity, which involve the determination of time of paralysis and death of worms. The extract revealed significant dose dependent anthelmintic activity at the highest concentration of 100 µg/ml as compared with Albendazole as standard reference. A and normal saline solution as control. The anthelmintic activity of methanolic extract of *Sphaeranthus amaranthoides* has therefore been demonstrated for the first time.

KEYWORDS: *Sphaeranthus amaranthoides*, *Pheretima posthuma*, Anthelmintic, Methanol extract, Soxhlet extractor.



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INTRODUCTION

The world health organization estimates that a staggering two billion people harbor parasitic worm infections ^[1]. Helminthiasis is still one among the most important human and animal diseases ^[2]. As we know very well, now a days the medicinal preparation available in the market from which most of them either not effective up to the mark or has to develop resistance resulting in reoccurrence again. Many of the plant materials used in traditional medicines are readily available in rural areas at relatively cheaper than modern medicines ^[3]. Plants generally produce many secondary metabolites which constitute an important source of microbicides, pesticides and many pharmaceutical drugs. Plant products still remain the principal source of pharmaceutical agents used in traditional medicine ^[4, 5]. The helminths which infect the intestine are cestodes. E.g. Tape worms (*Taenia solium*), nematode hook worm (*Ancylostoma duodenale*), round worm (*Ascaris lumbricoids*) and trematodes or flukes (*Schistosoma mansoni*) and *Schistosoma haematobium*). The diseases originated from parasitic infections causing severe morbidity include lymphatic filariasis, onchocerciasis and schistosomiasis. These infections can affect most populations in endemic areas with major social and economic consequences. The traditional medicines hold a great promise as source of easily available effective anthelmintic agents to the people, particularly in tropical developing countries, including India ^[6]. *Sphaeranthus amaranthoides* *Burm.f.* is a small procumbent herb, with stem rooting and pubescent with appressed hair leaves palmately 3 – foliolate. Features of the herb: low annuals with spreading branches, stem-erect, glabrous, sometimes as thick as the little finger, but short, branches- not winged and 8-12 inches, leaves- 2-4 inches, linear, oblong narrowed at the base. This plant is well known for its medicinal value for the treatment of eczema, blood disorder, stomach worms, filarial, fever and as a remover of kapha, vata and piles. It is also known to cure skin diseases. *S. amaranthoides* belongs to plant kingdom,

Dicotyledon class, Gamopetalae sub class, Inferae series, Asterales order and Asteraceae (compositae) family. It is weed of paddy field of southern India particularly in thoothukudi district, Tamil Nadu, India (Dec. 2011). A number of medicinal plants have been used to treat parasitic infections in man and animals ^[7]. The literature search reveals that still no work have been done on this plant and nobody evaluated anthelmintic activities ^[8]. The present study was done with the aim to investigate the anthelmintic activity of *Sphaeranthus amaranthoides* *Burm.f.*. In this experiment, we performed the In-vitro study of anthelmintic activity of natural drugs and compared with the standard drugs albendazole.

MATERIALS AND METHODS

Collection of the plant material

The entire plant of *S. amaranthoides* collected from the thoothukudi district, Tamil Nadu, India, Voucher No: SGIP, Ref No: 007 in the month of December 2011 and authenticated by Dr. V. Chelladurai, retired research officer-botany, Central council for research in Ayurveda and Siddha[CCRAS], govt. of India; Tirunelveli. Herbarium of the plant was prepared and preserved in the department of pharmacognosy, Dr. Samuel George Institute of Pharmaceutical Sciences, Markapuram, Prakasam dist. Andhra Pradesh.

Preparation of Extract

The collected entire plant material was washed thoroughly in water, then crushed in mortar pestle and exhaustively extracted by soxhlet extractor. 100gms of *S. amaranthoides* air dried and coarsely powder materials was extracted with 500ml methanolic solvent. After extraction, the sample was kept in dark for 72hrs with intermittent shaking. Then the solvent was evaporated by under the reduced pressure using Rota-vapour and to obtain viscous semi-solid masses.

Phytochemical Screening

The methanolic extract was tested and it revealed that the positive result of Steroids, Alkaloids, Sugar, Phenolic compounds, Flavonoids, Saponins, Tannins, anthraquinone and Aminoacids. Phytochemical screening of the extract was carried out according to the standard method [9].

Selection of worms

Indian adult earthworms (*Pheretima posthuma*) were used to carry out the anthelmintic evaluation. The earthworms were collected from the moist soil of Markapur. Worms were washed with saline water to remove the fecal matter and stored in Tyrode solution. Worms about 9 cm lengths and 0.2 -0.3 cm wide were selected for the experiment.

Evaluation of Anthelmintic Activity

The anthelmintic activity was performed according to the method of Ghosh et. al (2005) on the adult Indian earthworm (*Pheretima posthuma*) [10,11]. Earthworm of 9 cm length and 0.2- 0.3 cm wide were used. Three different concentrations (25µg/ml, 50 µg/ml, 100 µg/ml) of methanolic extract of *S. amaranthoides* were prepared. In the same manner, albendazole was included as reference compound and both reference and test solutions diluted with normal saline solution. Normal saline (0.9%NaCl) alone served as the negative control and accordingly poured into petridishes. Same petridishes of equal sizes were taken and labeled. Six earthworms (n=6) of mentioned sizes were placed in each petridish at room temperature.

Each petridish was placed and observed for paralysis or death. When no movement could be observed the mean time for paralysis was noted out except when the worm was shaken vigorously; the time death of worm (min.) was recorded after asserting that worms neither moved when shaken nor when given external stimuli. At last, the test result were compared with reference compound Albendazole (15mg/ml) treated sample.

RESULTS AND DISCUSSION

The methanolic extract of *Sphaeranthus amaranthoides* exhibited more potent activity at a higher concentration (100 mg/ml) against *Pheretima posthuma* (Indian earthworm) Table 1. When observed the response of worm in case of paralysis & death, there was significant variations of results produced by the methanolic extract of *Sphaeranthus amaranthoides* at different concentration. The methanolic extract exhibited anthelmintic activity in dose dependent manner varying from loss of movement (paralysis) to loss of response to external stimuli which eventually advanced into death. Methanolic extract of *Sphaeranthus amaranthoides* exhibited significant anthelmintic activity in dose dependent manner when compare with reference standard Albendazole (Graph1, 2). The methanolic extract of *Sphaeranthus amaranthoides* showed less time to cause paralysis (20.13 ± 0.14) min & death (31.51 ± 1.19) min at 100 mg/ml concentration (Table 1).

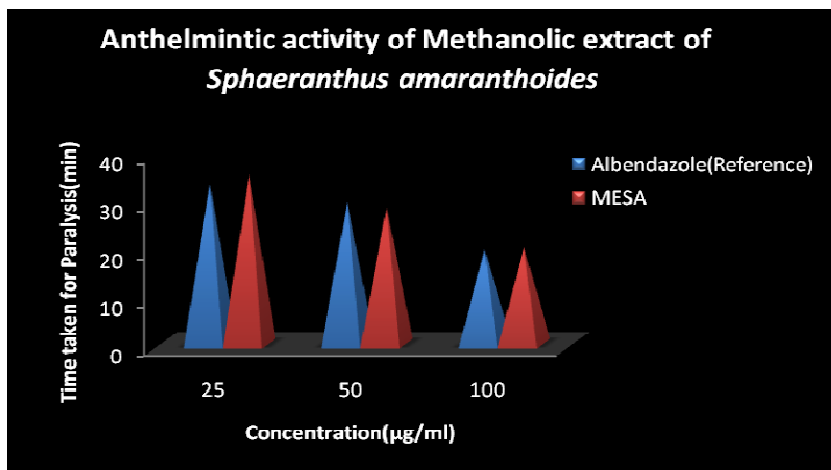
Test Sample	Conc. (µg/ml)	Time taken for paralysis (min.)	Time taken for Death (min.)
1. Control(Normal Saline)	-	-	-
2. Albendazole (Standard)	25	33.30 ± 0.13*	44.26 ± 0.45*
	50	29.58 ± 1.43*	40.10 ± 1.34*
	100	19.60 ± 0.53*	30.63 ± 0.88*
3. Methanol Extract	25	35.16 ± 0.16*	45.13 ± 1.01*
	50	28.32 ± 1.02*	40.16 ± 0.54*
	100	20.13 ± 0.14*	31.51 ± 1.19*

Table 1

Anthelmintic activity of Methanolic extract of *Sphaeranthus amaranthoides* values are Mean ± SEM; n=6 worms in each group* P<0.05 when compared with standard drugs.

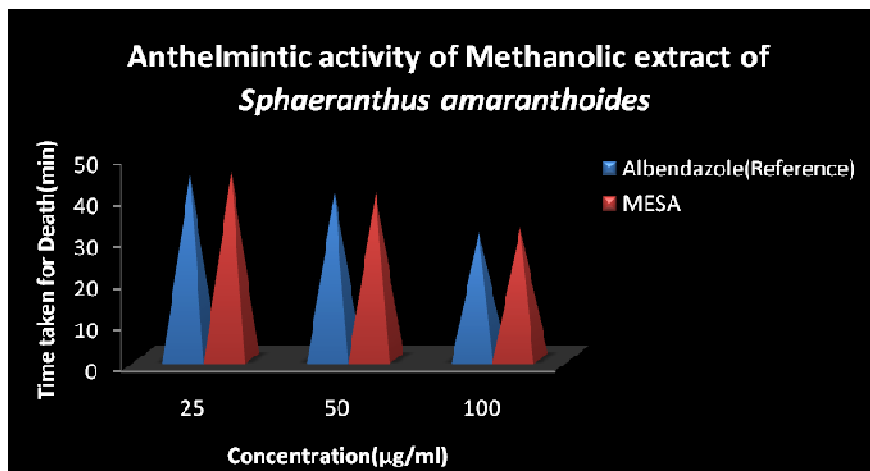
Graph 1

Time taken for paralysis using methanolic extracts of *Sphaeranthus amaranthoides* for evaluation of Anthelmintic activity.



Graph 2

Time taken for Death using methanolic extracts of *Sphaeranthus amaranthoides* for evaluation of Anthelmintic activity.



CONCLUSION

The anthelmintic activities of methanolic extract of *Sphaeranthus amaranthoides* have been tested against the worms *Pheritima Posthuma*. It has been seen in table no. 1 that the extract required higher concentration as compared to Albendazole as standard drugs for anthelmintic activity. Finally it concludes that the concentration of *Sphaeranthus amaranthoides* has significant anthelmintic activity for the study can be continued for In-vivo evaluation for some species other than *Pheritima Posthuma*

followed by isolating and characterization of particular chemical moiety for the activity.

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REFERENCES

1. Kumar Ashok B.S., Lakshman K., Jayaveera K.N., Nandeesh R., Manoj B. and Ranganayakulu D, 2010. "Comperative in vitro anthelmintic activity of three plants of amaranthaceae family" *Arch Biol Sci.* 62 (1): p. 185-89
2. Lateef M., Iqbal Z., Khan M.N., Aktar M.S. and Jabbar A, 2003. "Anthelminitic activity of *Adhatoda vasica* roots" *Int J Agri Biol.* 5 (1): p. 86-90
3. A.Mann, A. Bansa, L.C. Clifford, An Antifungal property of crude plant extracts from *Anogeissus leiocarpus* and *Terminalia avicennioides*. Tanzania J Health Res, 10 (1) (2008) 34-38.
4. M.B. Ibrahim, Anti-microbial effects of extract leaf, stem and root bark of *Anogeissus leiocarpus* on *Staphylococcus aureans*, *Streptococcus pyogenes*, *Escherichia coli* and *Proteus vulgaris*. J Pharma Devpt, 2(1997) 20-30.
5. O. Ogundipe, O. Akinbiyi, J.O. Moody (1998). Anti-bacterial activities of essential ornamental plants. Nigeria J Nat Prod Med, 2(1998) 46-47.
6. Temjenmongla and Yadav A, Anti-cestodal efficacy of folklore medicinal plants of naga tribes in North-East India, Afr J Trad cam, 2, 2, 2005, 129-133.
7. Nandan dey, Manas kumar Pal, Evaluation of anthelmintic activity of leaves of *paederia foetida*. International Journal of Pharma and Bio Sciences, Vol. 2/ Issue 1/ Jan-Mar 2011, 227-233.
8. Somnath De, Siddabathuni Aneela, Akalanka Dey, and A.M.S. Sudhakar Babu, 2013. "Phytochemical and GC-MS analysis of bioactive compounds of *Sphaeranthus amaranthoides*" *Burm, Pharmacognosy Journal* 5 (2013) 265-268.
9. Brindha P, Sasikala B, Purushothaman KK. Pharmacological studies on Merugan kizhangu. Bulletin of medico-Ethno-Botanical-Research 1981; 3: 84-96.
10. Ghosh T, Maity TK, Boseand A, Dash GK: Athelmintic activity of *Bacopa monierr*. Indian J Nat Prod 2005; 21:16-9.
11. Rastogi T, Bhutda V, Moon K, Aswar PB, Khadabadi SS: Comparative studies on anthelmintic activity of *Moringa oleifera* and *Vitex negundo*. Asian J Res Chem 2009; 2:181-2.