Saudi Journal of Medical and Pharmaceutical Sciences **ISSN 2413-4929 (Print)**
Scholars Middle East Publishers **ISSN 2413-4910 (Online)**
Dubai, United Arab Emirates
Website: http://saudijournals.com/ **DOI :** 10.36348/sjmps.2015.v01i02.002

Research Article

Anthelmintic Activity of Tulsi Leaves *(Ocimum Sanctum Linn)*–An In-Vitro Comparative Study

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Abstract: Anthelmintics derived from plant source can be an answer to this world wide problem as they form secure and non-toxic with a modified site of action. Ocimum sanctum Linn known as Tulsi in India is a sacred plant for hindus known from centuries and being used in Ayurveda for its varied healing properties belonging to the Labiateae family. To this purpose we have studied in vitro antihelminthic activity of osmium in comparison with albendazole. The leaves of Ocimum sanctum was taken from the Institute staff quarter's garden, which was endorsed by certified Taxonomist. The study was done using earth worms' adult type due to their anatomical resemblance with the intestinal roundworm parasites of humans. The suspension of aqueous extract of leaves of Ocimum sanctum Linn, concentration 100 mg/ml was prepared. Albendazole was used as standard reference drug and its 20 mg/ml concentration was prepared by as per the prescribed method. The anthelmintic activity was performed according to standard screening methods. Aqueous extract of Ocimum sanctum took145±14 minutes to paralyze and 223+11 minutes to death of the worm, whereas Albendazole took 92±18 minutes to paralyse and 165±17 minutes to death of the worm with significant ($P<0.05$) value. Aqueous extract is more potent than control (NS) and lesser antihelmintic acvitity than albendazole. Time to paralysis and consequent death were significantly higher in aqueous extract of Ocimum that of Albendazole at same concentrations. Aqueous extract of Ocimum sanctum Linn is more potent than control (NS) and lesser antihelmintic acvitity than albendazole. Time to paralysis and consequent death were significantly higher in aqueous extract of Ocimum that of Albendazole at same concentrations.

Keywords: Tulsi, Ocimum sanctum Linn, Antihelmintic acvitity, Albendazole, Earthworm

INTRODUCTION

Soil-transmitted helminthes like hookworm, roundworms have been documented major health public health tribulations in many under developed and developing countries [1,2]. Hookworm is mostly accountable for causing anaemia (38 % to 65.6 %), and it was obvious that the role of antihelminthic in benefit the anaemic condition of the pregnant women and children [3]. With the exception of Piperazine (benzimidazole) no other antihelminthics is found to be safe during first trimester of pregnancy [4]. An Anthelmintic substances having sizeable toxicity to humans, are present in foods derived from livestock, posing a severe warning to human health. A new lead for helminth control is much desirable and has promoted studies of traditionally used anthelmintic plants, which are generally considered to be important sources of bioactive substances [4,5]. Anthelmintics derived from plant source can be an answer to this world wide problem as they form secure and non-toxic with a modified site of action [7,8]. Ocimum sanctum Linn (*Ocimum tenuiflorum)* known as Tulsi in India, is a sacred plant for hindus known from centuries and being used in Ayurveda for its varied healing properties belonging to the Labiateae family.

It was used widely in the treatment of respiratory problems, gastrointestinal disturbances, skin problems, joint inflammatory conditions, eye related diseases, fever conditions, immuno stimulants and even for insect bite etc. The Ocimum sanctum also been recommended to hold antidiabetic [9,10] hepatoprotective, antifertility, anticancer, antifungal, antimicrobial, cardioprotective, antiemetic, antispasmodic, analgesic actions [11]. Tulsi also has been used as storing agent with grains to repel insects [12]. To this purpose we have studied in vitro antihelminthic activity of osmium in comparison with albendazole.

METHODS

This comparative study was undertaken at Katuri Medical College & Hospital, Guntur over the period of 3 months during 2008. The leaves of Ocimum sanctum was taken from the Institute staff quarter's garden, which was endorsed by certified Taxonomist from Nagarujana University, Guntur, Andhra Pradesh.

The experiment was done in Indian earthworms (Pheretima posthuma) adult type due to their anatomical resemblance with the intestinal roundworm parasites of humans. They earthworms were collected from moist soil and cleaned with tap water to remove all dirt matter.

The leaves of Ocimum sanctum Linn were dried under shade and crushed in an electric blender to form coarse powder and subjected to Soxhlet extraction by using water as solvent. The extracts were concentrated by rotary evaporator and used for testing anthelmintic activity. Albendazole was used as standard reference drug and its 20 mg/ml concentration was prepared by as per the prescribed method. The suspension of aqueous extract of leaves of Ocimum sanctum Linn, concentration 100 mg/ml was prepared and final volume was made up to 50 ml for relevant concentration. Groups of approximately equal size worms consisting of five earthworms individually in each group were released into in each 20 ml of desired concentration of drug and extracts in the petridish. The anthelmintic activity was performed according to standard screening methods [13,14]. Five Indian earth worms (adult) positioned in petridish containing 50 ml contained 100 mg/ml of aqueous extract of leaves of Ocimum sanctum Linn. Every petridish was placed with 5 earth worms and studied for paralysis or death. The mean time for paralysis was recorded when no movement of any sort could be observed, the time to death of worm (min) was recorded after ascertaining that worms not moved even with external physical stimuli. The test results were compared with reference compound Albendazole (20 mg/ml) treated samples. The procedure was repeated 3 times to verify the reading.

RESULTS

Aqueous extract of Ocimum sanctum took145±14 minutes to paralyze and 223+11 minutes to death of the worm, whereas Albendazole took 92±18 minutes to paralyse and 165±17 minutes to death of the worm with significant (P<0.05) value. Aqueous extract is more potent than control (NS) and lesser antihelmintic acvitity than albendazole. Time to paralysis and consequent death were significantly higher in aqueous extract of Ocimum that of Albendazole at same concentrations.

Table-1: Evaluation of antihelmintic activity

S. No	Antihelmenthic Substance	Time taken for Paralysis (Minutes)	Time taken for Death (Minutes)
1	Normal Saline	No action took	No action
2	Aqueous extract of Ocimum sanctum	145±14	223+11
3	Albendazole	92±18	165±17
	P-Value	P<0.05	P<0.05

DISCUSSION

The aqueous extract of leaves of Ocimum sanctum showed good activity against Pheretema posthuma at the tested concentrations. Eugenol was the active constituent present in Ocimum sanctum L., has been found to be accountable for the therapeutic potentials of Tulsi [16]. Our data was also correlating with studies of D. J. Taur *et al.* [6] and Kamlesh Chandra Joshi *et al.* [12] and L. S. Verma *et al.* [17] study has proved their anthelmintic activity of Ocimum sanctum L. in Syphacia muris in Mice to be taken into consideration for strong antihelmintic activity.

Limitations of the Study

The bioactivity guided demonstration of anthelmintic activity helps in standardization of its anthelmintic activity.

CONCLUSION

Aqueous extract of Ocimum sanctum Linn is more potent than control (NS) and lesser antihelmintic acvitity than albendazole. Time to paralysis and consequent death were significantly higher in aqueous extract of Ocimum that of Albendazole at same concentrations.

The present study leads to strong conclusion to previous studies that the leaves of Ocimum sanctum have potent anthelmintic activity when compared in comparison with control and can be consider for antihelmentic agents during first trimester of pregnancy. The results did not, however, exclude the possibility that doses of the extract with lower anthelmintic activity in this study might be efficacious against other species of helminths. Additional studies using in vivo models and to isolate active constituents from extract are essential to carry out and established the value and rationale for the use of Ocimum sanctum as an anthelmintic drug.

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