



REGULAR ARTICLE

ANTHELMINTIC ACTIVITY OF TOMATO LEAF EXTRACT

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SUMMARY

The aim of the present study was to investigate the anthelmintic activity of tomato (*Solanum lycopersicum*) leaf extract using adult earthworm, *Pheritima posthuma*. The methanolic extract of the crude drug of different concentrations were tested which involve determination of paralysis time and death time. Albendazole is used as standard and it was found that the methanolic extract of the tomato leaves showed a better anthelmintic activity in comparison with the standard.

Key words: Anthelmintic activity, Albendazole, Earthworm, Tomato

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1. Introduction

Anthelmintics or antihelminthics are the drugs or the agents that destroy or cause the expulsion of parasitic intestinal worms. Helminthes infections are now being recognized as cause of many acute as well as chronic ill healths among the various human beings as well as cattle's. 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. Treatment with an antihelminthic 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 occurs¹. 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 sites².

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 animals³. Herbal remedies are considered the oldest forms of health care known to mankind on this earth. The parts of the plant used for medicinal purposes are leaves, root, stem, fruits, the complete aerial parts, the whole plant, barks (root and stem) and flowers. However, leaves were found as the most frequently used part⁴.

Traditional system of medicine reports the efficacy of several natural plants in eliminating worms. We have focused our attention on search of herbal remedy and selected tomato plant to evaluate the anthelmintic activity using adult earthworm, *Pheritima posthuma*. The tomato (*Solanum lycopersicum*, syn. *Lycopersicon lycopersicum*) is herbaceous, usually sprawling plant in the Solanaceae family. It is a perennial, often grown outdoors in temperate climates as an annual, typically reaching to 1-3m (3 to 10 ft) in height, with a weak, woody stem that often vines over other plants. Tomato leaves were chosen as they are easily available and can be used as feed to the cattle to prevent helminthic infections, however only after determining its-safety.



2. Material and Methods

Collection of Plant Materials

The tomato (*Solanum lycopersicum*) plant leaves were collected from the fields nearby Vignan hills, Deshmukhi, Andhra Pradesh during September – October 2010 which was authenticated and confirmed by Ms. K. Chaitanya Sravanthi, Head, Department of Pharmacognosy, Vignan Institute of Pharmaceutical Sciences, Hyderabad. The leaves after collection were washed to remove the debris and then shade dried and the dried leaves were powdered to get a coarse powder.

Preparation of Extract

The dried powder material of *Solanum lycopersicum* (200 gm) was taken in 1 lit beaker and sufficient quantity of methanol was added, then it was kept for maceration for 72 hours. The methanolic extract obtained was filtered and distilled to obtain a concentrate of 15gm.

Experimental Model

Adult

earthworm *Phertima prosthuma* were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being^{5, 6}) from moist soil, obtained from agricultural fields nearby Vignan hills, Deshmukhi, A.P.-India. All the worms were washed with normal saline to remove all faecal matter was used for the anthelmintic study.

Anthelmintic activity

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% DMF⁷. The methanolic tomato leaf 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. All drugs and extract solutions were freshly prepared before starting the experiment. For every test group, all the six worms were individually placed in Petri dish containing 10ml of test solution. 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.

3. Results and Discussion

The data revealed that the methanolic extract of the tomato leaves showed significant antihelmintic activity. However the safety of the tomato leaf extract and the chemical constituents responsible for the activity has to be determined. Further studies have to be carried out on this in future.

Table 1: Anthelmintic activity of methanolic tomato leaf extract

S. No.	Test group	Concentration (mg/ml)	Paralysis onset time (min)	Death time (min)
1.	Control	-	-	-
2.	Methanolic tomato leaf extract	10	2.23±0.01	12.15±0.12
		20	2.03±0.02	10.25±0.06
		30	1.47±0.02	4.77±0.11
		40	1.34±0.01	4.24±0.03
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

4. Conclusion

The methanolic extract of the tomato leaves was more effective even at lower concentrations in causing paralysis and death of earthworms than the Standard drug, Albendazole. It can be concluded that active constituents responsible for anthelmintic activity are present in the methanolic extract of leaves of *Solanum lycopersicum*.

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