

Research Article

Evaluation of Phytochemical Screening and *In vitro* Anthelmintic Activity of *Malvastrum coromandalianum*

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ABSTRACT

In the present study the leaves extract of *Malvastrum coromandalianum* were evaluated for its phytochemical screening and anthelmintic activity against Indian earthworm *Pheretima posthuma* and compared with standard drug Albendazole. Various concentrations of leaves extract of *Malvastrum coromandalianum* (25, 50, 75, 100mg/ml) were screened for their anthelmintic activity which involved the parameters such as time of paralysis and time of death of worms. The extract has shown significant effect and it also shows the presence of different phyto chemical constituents such as carbohydrates, proteins, amino acids, flavonoids and different phenolic compounds. In conclusion the use of leaves of *Malvastrum coromandalianum* as an anthelmintic have been confirmed and further studies are suggested to isolate the active principles responsible for the activity. The present study indicated the potential usefulness of *Malvastrum coromandalianum* against earth worm infections.

Keywords: Methanolic extract, phytochemical screening, anthelmintic activity, albendazole, *Pheretima posthuma*.

INTRODUCTION

The plant products have been source of medicinal agents since the ancient time. The plants are known to provide a rich source of anthelmintics, antibacterials and insecticides¹. Plants contain many medicinal properties like antibacterial, anti-malarial, anti-fungal, anti-diabetic, anti diarrhoeal, hepatoprotective, anti-cancer, antioxidant, anti-inflammatory etc. A number of medicinal plants have been used to treat parasitic infections in man and animals. Parasitic helminthes affect the human beings as well as animals leading to considerable hardship and stunted growth. Majority of the infections are due to the worms are generally limited to a topical regions. The world health organization reveals that over two billion people are suffering from parasitic infections². It is estimated that by the year of 2025, about 57% of the people will be influenced³. Traditional medicine is one of the oldest method of curing diseases and infections by using various plants. A huge population partially or entirely still depends on botanicals to treat human diseases and infections. Whole plant and different parts of the plant are used to treat various forms of diseases and infections. During the past few decades, despite numerous advances made in understanding the mode of transmission and treatment of these parasites, there are still no efficient products to control certain helminthiasis. As an important component of complementary and alternative medicine, traditional medicinal plants may be useful to discovery and development of new chemical substance for helminthes control⁴. Herbal drugs have been in use since ancient times for the treatment of parasitic disease in human and could be of value in preventing development of resistance^{5,6}. Many ancient nations have awakened to the importance of herbal medicine which brings more cures⁷.

Indian medicinal plants also provide a rich source of antioxidants that known to prevent different diseased states. The antioxidant protection observed at different levels⁸.

Parasitic diseases cause severe morbidity, including lymphatic filariasis, onchocerciasis and schistosomiasis. These infections can affect most populations in endemic areas with major economic and social consequences⁹. The prevalence of parasitic helminthes typically displays a negative binomial distribution within an infected population such that relatively few persons carry heavy parasite burdens. Without treatment, those individuals are most likely to become ill and to perpetuate infection within their community¹⁰. Helminthes infections are now being recognized as cause of many acute as well as chronic ill health among the various human beings as well as cattle's. More than half of the populations of the world suffer from infection of one or the other and majority of cattle's suffer from worm infections¹¹. Most of the existing anthelmintics produce side effects such as abdominal pain, loss of appetite, nausea, vomiting, headache and diarrhea¹². Anthelmintics from natural sources may play a key role in the treatment of parasitic diseases¹³.

MATERIALS AND METHODS

Plant collection and authentication

The leaves of *Malvastrum coromandalianum* were collected from local region of Narsapur, Medak district, Telangana, India in the month of October, 2016. The plant was authenticated by a botanist Prof T. Mohana Department of Botany, Government Mehbubia Junior college, Gun foundry, Hyderabad. The leaves should be



collected and removed all earthy matter and wash with tap water.

Collection of worms

Indian earth worms *Pheretima posthuma* was collected from the water logged areas of the soil and identified and washed with water to remove all dirty matter which is present on earthworms.

Chemical and drugs

Alcohols (methanol), Albendazole, CMC (Carboxy Methyl Cellulose) were used in the experiment protocol.

Preparation of plant extract

The leaves of *Malvastrum coromandalianum* were dried under shade and crushed in an electrical blender to form a coarse powder then the powder was subjected to soxhlation by using methanol for 72 hours. After seven days the extract was concentrated and used for testing the desired activity.

Preliminary phytochemical screening

The methanolic extract was subjected to qualitative identification of phyto constituents like carbohydrates, proteins, amino acids, glycosides, flavonoids, sterols etc. Phytochemical screening was carried according to the standard procedures^{14,15}.

Preparation of various concentrations

The methanolic extract of *Malvastrum coromandalianum* was made into different concentrations (25mg/ml, 50mg/ml, 75mg/ml, and 100 mg/ml) by dissolving in normal saline solution. Albendazole was prepared by using 0.5% w/v of CMC (Carboxy Methyl Cellulose) as suspending agent.

Experimental design

The anthelmintic activity was carried according to standard method¹⁶. Adult Indian earthworm *Pheretima posthuma* has anatomical and physiological resemblance with the intestinal round worm parasites of human

beings. Indian earthworms were placed in a petridish containing different concentrations (25 mg/ml, 50 mg/ml, 75mg/ml, and 100 mg/ml) of methanolic extract of *Malvastrum coromandalianum* and standard compound Albendazole. Each petridish contains earthworms and observed for time of paralysis as well as time death. Time of paralysis recorded when no movement of any sort could be observed, except when the worm was shaken vigorously as well as time of death was recorded after ascertaining that worms neither moved when shaken. Finally the test results were compared with standard reference compound Albendazole.

RESULTS AND DISCUSSION

Phytochemical screening of leaves extract of *Malvastrum coromandalianum* reveals the presence of carbohydrates, proteins, amino acids, flavonoids, tannins and glycosides. Methanolic extract shows significant effect on *pheretima posthuma*. it was taken short time to paralyze as well as death. Based on our observations, higher concentration of extract produced paralytic effect much earlier and the time taken for paralysis and death was shorter when compared with the standard reference sample (Albendazole).

Table 1: Phytochemical screening of leaves extract of *Malvastrum coromandalianum*.

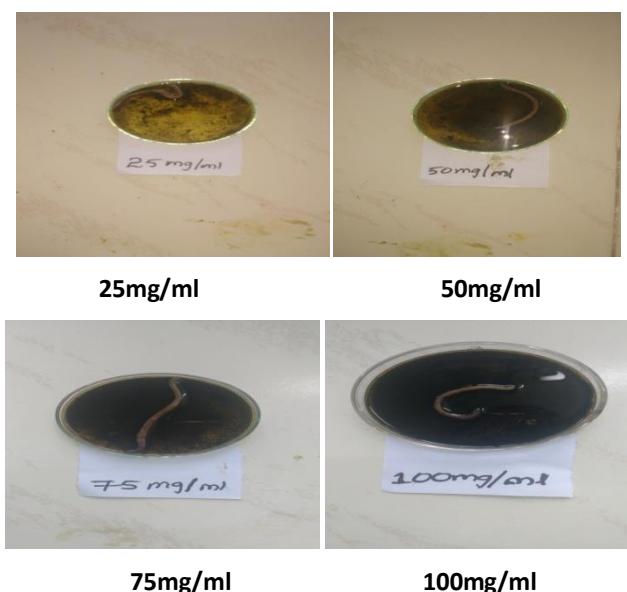
Constituents	Methanolic extract
Carbohydrates	+
Amino acids	+
Glycosides	+
Proteins	+
Tannins	+
Flavonoids	+

Note: + (present) - (absent)

Table 2: Anthelmintic activity of methanolic extract of *Zaleya decandra* and standard Albendazole.

Extract	Concentrations (mg/ml)	Pheretima posthuma	
		Paralysis(min)	Death(min)
Methanolic extract	25mg/ml	30±1.34	37±0.18
	50mg/ml	23±0.94	34±0.62
	75mg/ml	19±0.09	25±0.57
	100mg/ml	18±0.61	24±0.99
Albendazole	25mg/ml	40±0.43	43±1.38
	50mg/ml	35±0.60	39±0.59
	75mg/ml	31±0.81	30±1.38
	100mg/ml	21±1.4	23±0.92





CONCLUSION

The methanolic leaf extract of *Malvastrum coromandalianum* has showed significant anthelmintic activity. At higher concentrations the methanolic extract shows higher activity.

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