

Phytochemical Screening and In vitro Anthelmintic Activity of *Alysicarpus monilifer*

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Available Online: 15th October, 2016

ABSTRACT

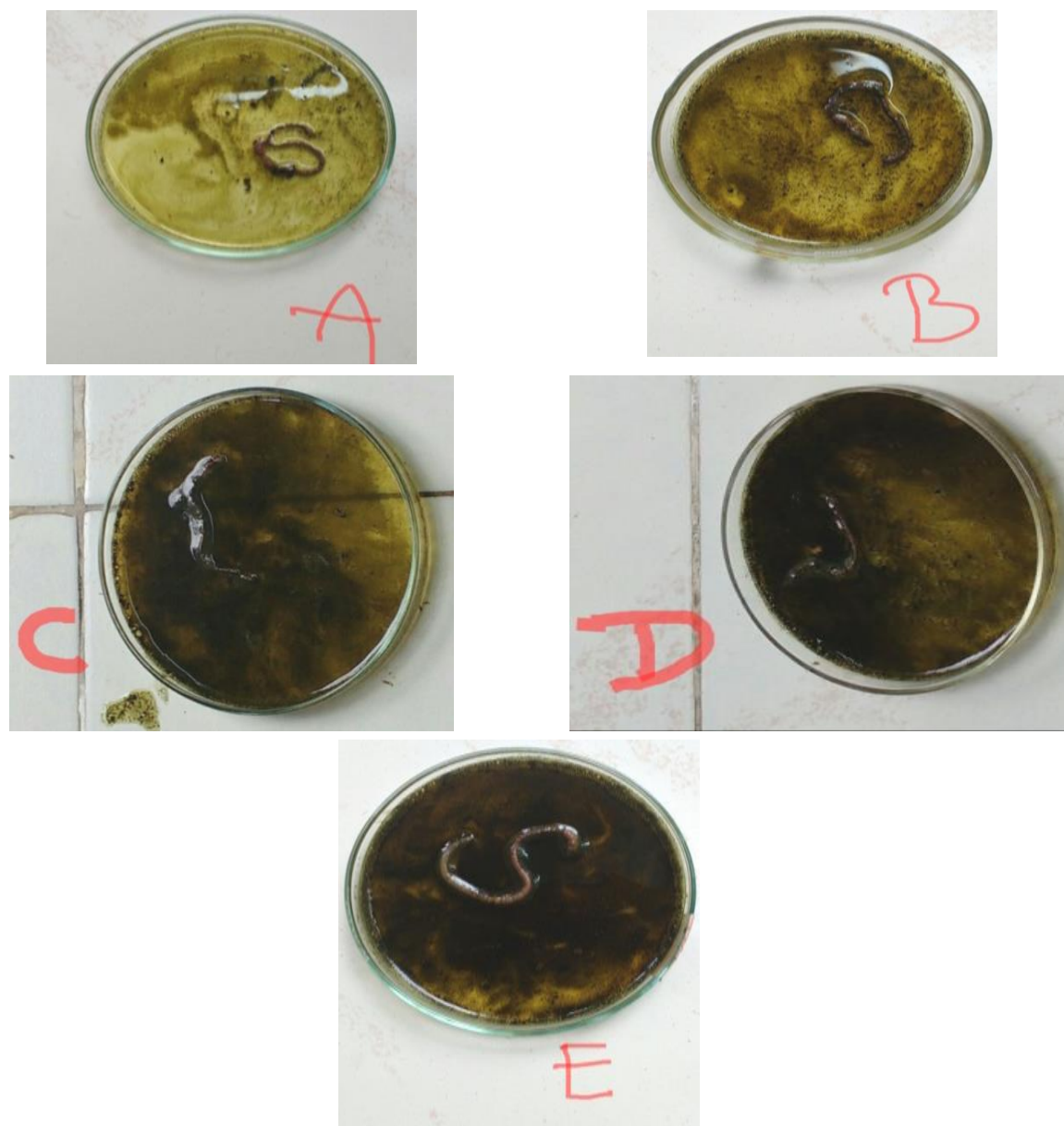
The present study aimed at the in-vitro evaluation of anthelmintic activity of Methanolic extract of leaves of *Alysicarpus monilifer* at five different concentrations (10, 20, 30, 40 and 50 mg/ml) respectively. The extract was screened for anthelmintic activity against Indian earth worm *Pheretima posthuma*. The results were expressed in terms of time for paralysis and time for death of worms. Albendazole was used as standard control group. All extracts exhibited Significant activity compared to standard Albendazole. In conclusion, the use of leaves of *Alysicarpus monilifer* as an anthelmintic have been confirmed and further studies are suggested to isolate the active principles responsible for the activity.

Keywords: Anthelmintic, *Alysicarpus monilifer*, *Pheretima posthuma*, Albendazole, Methanolic extract, Phytochemical screening.

INTRODUCTION

Helminthic infections are very common in man. Helminthic infections are large threat to human beings health in developing countries. It contributes malnutrition, anemia and pneumonia. Majority of the infections are due to worms are generally limited to topical regions. The World Health Organization reveals that over two billion people are suffering from parasitic worm infections¹. It is estimated that by the year 2025, about 57% of the population in developing countries will be influenced². The prevalence of parasitic helminths 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 community³. Anthelmintics are drugs that may act locally to expel worms from the GIT or systemically to eradicate adult helminths or development forms that invade organs and tissues⁴. 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 population of the world suffers from infection of one or the other and majority of cattle's suffers from worm infections⁵. In most developing and less developed countries, helminth infections are a major health concern because they predispose humans to other infections such as fungal and bacterial infections⁶. Intestinal infections with worms can more easily treated than those the infections that occurs in other locations in the body, because the worms need to be killed by the drug and the drug need not be absorbed when given by oral route⁷. Most of the existing anthelmintics produces side effects such as abdominal pain, loss of appetite, nausea,

Vomiting, headache and diarrhoea⁸. Anthelmintics from the natural sources may play a key role in the treatment of these parasite infections⁹. In ethnomedicine, at least 80% of the world's population in developing countries uses plant materials as their source of primary health care¹⁰. Increasing problems of development of resistance in helminths against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity¹¹. Because of the increasing anthelmintic resistance and the impact of conventional anthelmintics on the environment, it is important to look for alternative strategies against parasitic worms. Plants provides all needs in terms of clothing, food, shelter and important medicines to living things. Many medicinal drugs are obtained from plant materials. Plants are basic source for medicines which contains medicinal properties like antibacterial, antimalarial, hepato protective, anti diarrhoeal etc.,. The plants are used as medicinal purposes. *Alysicarpus monilifer* is a low growing much branched annual or perennial herb, 5-15 (-50) cm tall. Leaves simple; ovate, elliptical or lanceolate, cordate at the base, 2.5-7.5 cm long, prominently nerved, glabrous or sparsely pubescent beneath. Racemes spicate, axillary and terminal, 1-15 cm long; flowers lax in dense along racemes. Pods distinctly moniliform, 3-5 jointed, 1-2 cm long, calyx not longer than first joint; glabrous or sparsely pubescent; articles 2.5-3 mm long and 2-3 mm wide, with a smooth to reticulate surface sculpture. *Alysicarpus monilifer* L. (DC.) (Fabacea), commonly known as Samervo (Gujarati) or Juhi ghas (Hindi), is a turf forming legume and native to Africa and Asia. In India it is distributed throughout the plains Madras, Jammu, Bombay, Punjab, Gujarat except Kutch and Bulsar, Madhya Pradesh and Uttar Pradesh.



A:10mg/ml B:20mg/ml C:30mg/ml D:40mg/ml E:50mg/ml

Figure 1: Anthelmintic potency of Methanolic extract of *Alysicarpus monilifer* at Various Concentrations.

Table 1: Phytochemical screening of *Alysicarpus monilifer* leaves extract.

Constituents	Methanolic extract
Alkaloids	+
Glycosides	+
Sterols	+
Proteins	+
Tannins	-
Starch	+
Flavonoids	+
Amino acids	+
Saponins	-

Note: +(present) -(Absent)

This plant is used traditionally as an anti-inflammatory and in stomach ache¹². It is an antidote to snake bite¹³. It is also used in skin diseases and as a diuretic^{14,15}. The leaves are

used in fever¹⁶ and jaundice¹⁷ and it also shows the multiple pharmacological activities such as antimicrobial, antimalarial, anti diarrhoeal, hepatoprotective etc. However, anthelmintic activity of leaves of *Alysicarpus monilifer* has not so far been scientifically proved, so the present study was carried out to assess the anthelmintic activity of *Alysicarpus monilifer* against Indian earth worm *Pheretima posthuma*.

MATERIALS AND METHODS

Plant collection and authentication

The leaves of *Alysicarpus monilifer* were collected in the month of July from Kagazmaddur village, Medak district of Telangana, India and authenticated by D. Venkateshwara Rao, Deputy Director, A.P Forest Academy, Dullapally, Hyderabad. The leaves should be

Table 2: Anthelmintic potency of Methanolic extract of *Alysicarpus monilifer* and Albendazole (Standard).

Extract	Concentrations (mg/ml)	Pheretima postuma	
		Paralysis(min)	Death(min)
Methanolic extract	10mg/ml	9±1.34	28±0.986
	20mg/ml	7±1.00	22±1.670
	30mg/ml	4±0.08	20±1.654
	40mg/ml	4±1.987	18±0.259
	50mg/ml	3±0.876	16±1.703
Standard (Albendazole)	10mg/ml	16 min ± 17	21 min± 12
	20mg/ml	15 min ± 13	19 min± 15
	30mg/ml	15 min ± 13	18 min± 15
	40mg/ml	14 min ± 13	17 min ± 15
	50mg/ml	12 min ± 18	16 min± 21

collected and removed all earthy matter and washed with tap water

Worms Collection and authentication

Pheretima posthuma was collected from the water logged areas of the soil and identified, washed with water to remove all dirty matter.

Chemicals and drugs used

Alcohol(Methanol), Albendazole, CMC (Carboxy methyl Cellulose) were used during the experiment protocol. All the chemicals used are laboratory and Analytical grade.

Preparation of Plant extract

The leaves of *Alysicarpus monilifer* were dried under shade and crushed in an electric blender to form coarse powder and subjected to Soxhlet extraction (Continuous hot extraction) by using methanol as solvent for 72 hrs. The extracts were concentrated by rotary evaporator and used for testing anthelmintic activity.

Preliminary phytochemical investigation

The Methanolic leaf extract was subjected to qualitative chemical investigation for the identification of different phytoconstituents like sterols, glycosides, saponins, carbohydrates, alkaloids, flavonoids, tannins, proteins, triterpenoids. Phytochemical screening of the extracts was performed using the standard procedures^{18,19}.

Preparation of Different Concentrations

Albendazole was prepared by using 0.5% w/v of CMC as suspending agent. The methanolic extract of *Alysicarpus monilifer* (10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml, 50mg/ml concentrations) were prepared by dissolving in normal saline.

Experimental Design

The anthelmintic activity was performed according to the method²⁰. On adult Indian earth worm *Pheretima posthuma* as it has anatomical and physiological resemblance with the intestinal round worm parasites of human beings. *Pheretima posthuma* was placed in petridish containing different concentrations (10,20,30,40,50 mg/ml) of methanolic extract of leaves of *Pheretima posthuma* and Standard compound Albendazole. Each petridish was placed with 2 worms and observed for paralysis or death. Mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; the time death of worm (min) was recorded after ascertaining that worms neither moved when shaken nor when given external stimuli. The test results were

compared with Reference compound Albendazole treated samples.

RESULTS AND DISCUSSION

Preliminary phytochemical screening of *Alysicarpus monilifer* indicates presence of carbohydrates, alkaloids, tannins, sterols, proteins, glycosides, flavanoids and amino acids. Methanolic extract of plant extract such *Alysicarpus monilifer* shows significant effect on *Pheretima posthuma*. It will take less time to paralyze as well as death. From our observations, higher concentration of extract produced paralytic effect much earlier and the time taken for death was shorter. Methanolic extract of *Alysicarpus monilifer* exhibited anthelmintic activity in dose-dependent manner showing maximum efficacy at 50 mg/ ml concentration. Our plant extract exhibited more potent activity at 40 & 50 mg/ml concentration against *Pheretima posthuma* than the Standard drug Albendazole. The other test concentrations of extracts showed marked degree of anthelmintic activity. Anthelmintic activity of the extract was compared with the standard drug Albendazole (Table.2). From the above results, we can conclude that *Alysicarpus monilifer*, exhibited significant anthelmintic activity. Therefore, further study must be carried out so that the general people can get actual benefit from this important medicinal plant.

CONCLUSION

The *Alysicarpus monilifer* leaf extracts has showed significant anthelmintic activity at all the tested doses, when compared to Standard drug Albendazole highest activity exhibited by the higher concentrations (40 & 50 mg/ml). But further studies using in vivo models and to isolate active constituents from extract are required to carry out and established the effectiveness and pharmacological rational for the use of *Alysicarpus monilifer* as an anthelmintic drug.

ACKNOWLEDGEMENT

We are grateful to our Principal Dr. A. Ramesh, staff members, Director and our honorable chairman Sri. K. V. Vishnu Raju garu of Vishnu Institute of Pharmaceutical Education and Research(VIPER), for providing us necessary facilities to carry out the research project.

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