



RESEARCH ARTICLE

PRELIMINARY PHYTOCHEMICAL ANALYSIS AND ANTHELMINTIC ACTIVITY OF ETHANOLIC EXTRACT OF *POTULACA QUADRIFIDA* WHOLE PLANT

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ABSTRACT

The plant extract Ethanolic solution was assessed for the existence of the phytochemical analysis by using the standard methods The Ethanolic extract of *Potulaca Quadrifida whole plant* was investigated for anthelmintics activity using earthworms (*Pheretima posthuma*), various concentrations (50 and 100 mg/ml) of plant extract were tested. Piperzine citrate (10 mg/ml) was used as reference standard drug whereas distilled water as control. Determination of paralysis time and death time of the worms were recorded. Extract exhibited significant anthelmintics activity at the concentration of 100 mg/ml. The result shows that aqueous extract possesses vermucidal activity and found to be effective as anthelmintics. Therefore, the anthelmintics activity of the Ethanolic extract of *Potulaca Quadrifida whole plant* has been reported

Key words: *Potulaca Quadrifida*, *Pheretima posthuma*, Piperzine citrate

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INTRODUCTION

Helminthiasis (plural *helminthiases*), also known as worm infection, is any macroparasitic disease of humans and other animals in which a part of the body is infected with parasitic worms, known as helminths. There are numerous species of these parasites, which are broadly classified into tapeworms, flukes, and roundworms. They often live in the gastrointestinal tract of their hosts, but they may also burrow into other organs, where they induce physiological damage. Soil-transmitted helminthiasis and schistosomiasis are the most important helminthiases, and are among the neglected tropical diseases.^[1]

This group of helminthiases have been targeted under the joint action of the world's leading pharmaceutical companies and non-governmental organizations through a project launched in 2012 called the London Declaration on Neglected Tropical Diseases, which aims to control or eradicate certain neglected tropical diseases by 2020 (Angstadt *et al.*, 1989). Helminthiasis has been found to result in poor birth outcome, poor cognitive development, poor school and work performance, poor socioeconomic development, and poverty (Aubry *et al.*, 1970; Behm *et al.*, 2015). Chronic illness, malnutrition, and anemia are further examples of secondary effects (Bokisch and Walker, 1986).

MATERIAL AND METHODS

Plant collection and authentication: The fresh aerial parts of *Portulaca Quadrifida* Linn. Was collected nearly 3.5 kg each from the rural belt of the Narasaraopet Guntur Dist., Andhra Pradesh, India. The plant was botanically identified and authenticated by Mr. Rajanala Venu Madhav, Department of Botany, S.S.N College, Narasaraopet, and Guntur Andhra Pradesh, India. A vouche specimen (*Portulaca Quadrifida* Linn.) were kept in Department of Botany, S.S.N College, Narasaraopet, and Guntur Andhra Pradesh, India.

Preparation of Extract: Extraction is a process where the main focus is on the materials to be extracted and the type(s) of the compound that is being isolated. The best way to get the extract is boiling the plants parts in ethanol. The classical chemical procedure for obtaining organic constituents from dried plant tissue is to continuously extract powdered material in a percolation apparatus within a range of solvent Ethanol etc. Aerial parts were separated out and washed with plenty of water. Then the plants were dried in shade and then milled in to coarse powder by a mechanical grinder. The powder was kept in air tight container for further extraction was carried out using the solvents as per their polarity. The extracts were filtered through Whatman filter paper to remove any impurities if present. The extracts were then concentrated by vacuum distillation. The concentrated extracts were placed in vacuum

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desiccators to remove the excess moisture. The dried extracts were weighed and the yields of the extracts were calculated. The extracts were then kept in airtight container for further

Drugs and Chemicals: Piperzine citrate was used as standard anthelmintics during the experimental protocol

Anthelmintic activity: Anatomical and physiological characteristic of Indian earth worm resemblance with the intestinal round worm parasite of human being, therefore *Pheretima posthuma* have taken in this study to assess anthelmintics activity of *P. Quadrifida*. Indian earth worms are divided into three groups each containing six earthworms approximately of equal size in following manner,

Group I: Control (normal saline)

Group II: standard (10 mg/ml)

Group III: Plant extracts (50 and 100 mg/ml)

Fifty milliliters of respective drug solutions were taken in petri dishes and the earthworms were released in to the solution. Earth worms were monitored carefully and observations were made for the time taken to paralyze and death of individual worms. Time taken to till paralysis was recorded when no movement could be observed except when the worms were shaken vigorously. Times taken for death of worms were noted after ascertaining that the worms lost their motility completely with fading of their body colour. To confirm, the death worms were shaken vigorously or dipped in warm water at 50 °C but no movement was observed.

RESULTS AND DISCUSSION

On the basis of the percentage yield of the extracts Ethanolic extracts had shown the more yield among the all other extracts in both the plants. Ethanolic extracts of both the plants had been investigated for detection of the presence of their phytochemical constituents.

Table 1. Preliminary phytochemical investigation of Ethanolic extract of *Potulaca Quadrifida*

Phytoconstituents	<i>Potulaca Quadrifida</i>
Alkaloids	+
Carbohydrates	-
Flavonoids	+
Glycosides	-
Mucilage	-
Phytosterols	+
Proteins& amino acids	+
Saponins	+
Tannins	-
Flavanoids	+
Triterpenoids	+

+ = Present, - = Absent

Table 2. In vitro anthelmintics effect of *portulaca quadrifida* leaves extract against *pheretima posthuma*

Treatment	Concentration (mg/ml)	Paralysis time (min)	Death time (min)
Control	-	-	-
Plant Extracts	50	38.86± 0.36	102.37 ±1.3
	100	25.09 ±0.39	76.37±1.36
Piperazine citrate	10	25.43±0.72	68.33±0.78

The extract was tested for the presence of alkaloids, carbohydrates, glycosides, gums and mucilage, proteins and amino acids, tannins and phenolic compounds, steroids and sterols, triterpenoids and flavonoids. The Ethanolic extract of *Portulaca Quadrifida* Linn. had shown the most of the positive tests for the presence of secondary metabolites. Ethanolic extract showed the positive tests for alkaloids, flavonoids, triterpenoids, tannins, saponins, amino acids

Anthelmintics activity of Ethanolic extract of *Portulaca Quadrifida* was performed against Indian earthworm *Pheretima posthuma*



Fig. 1. Study of anthelmintics activity, control group



Fig. 2. Study of anthelmintics activity, piperzine citrate treated group



Fig. 3. Study of anthelmintics activity, plant extract 50mg treated group



Fig. 4. Study of anthelmintics activity, plant extract 100mg treated group

Anthelmintics activity of mixture of methanol and ethyl acetate extract of *Portulaca Quadrifida* was performed against Indian earthworm *Pheretima posthuma*. *Portulaca Quadrifida* extract produced moderate activity. At 50 and 100 mg/ml concentration, extract produced paralysis in worms after 36.86 ± 0.36 and 25.09 ± 0.39 min, while at same concentration after 102.37 ± 1.3 and 76.37 ± 1.36 min produced death in earthworms respectively. Standard drug piperazine citrate at 10 mg/ml concentration, showed the potent activity which was evident by the quick paralysis time (25.43 ± 0.72) and death time (68.33 ± 0.78 respectively). The paralysis and death times of the extract, fractions and standard drug are given in Table and figures depicts the *Pheretima posthuma* state with control, extract and piperazine citrate.

DISCUSSION

The present research work has been summarized in a brief informative way, to identify the herbal based plant drug in the treatment of metabolic disorders in which two medicinal plants *Portulaca Quadrifida* was focused on phytochemical and In-vitro Anthelmintics activity used for many years in India to treat different ailments. plant extract had been investigated for detection of the presence of their phytochemical constituents. On the basis of the percentage yield of the extracts ethanolic extracts had shown the more yield in the plants. The ethanolic extract of *Portulaca quadrifida* had shown the most of the positive tests for the presence of secondary metabolites.

Ethanolic extract showed the positive tests for alkaloids, flavonoids, triterpenoids, tannins, saponins, amino acids and glycoside. Anthelmintic activity of mixture of methanol and ethyl acetate extract of *Portulaca quadrifida* was performed against Indian earthworm *Pheretima posthuma*. *Portulaca quadrifida* extract produced moderate activity. At 50 and 100 mg/ml concentration, extract produced paralysis in worms after 36.86 ± 0.36 and 25.09 ± 0.39 min, while at same concentration after 102.37 ± 1.3 and 76.37 ± 1.36 min produced death in earthworms respectively. Standard drug piperazine citrate at a 10 mg/ml concentration, showed the potent activity which was evident by the quick paralysis time (25.43 ± 0.72) and death time (68.33 ± 0.78 respectively).

Conclusion

From the above results it is concluded that the Ethanolic extract showed the positive tests for alkaloids, flavonoids, triterpenoids, tannins, saponins, amino acids and Extraction of *Portulaca Quadrifida* demonstrated potent in-vitro anthelmintics activity tested against Indian earthworm *Pheretima posthuma*. However no clear inference can be drawn at this stage and hence we consider the work for further extensive research.

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