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Phytochemical and Anthelmintic Activity of *Andrographis Paniculata* Leaves Extracts

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ABSTRACT

The present study was aimed to investigate the phytochemical and anthelmintic effect of aqueous and acetone extracts of *Andrographis paniculata* leaves on Indian earth-worm *Pheretima posthuma.* The aqueous and acetone extracts were prepared and various phytoconstituent tests were conducted to find the compounds present in the leaves of *A. paniculata.* Then *in vitro* activity is determined. Three concentrations (10, 50, 100 mg/ml) of each extract were studied in activity which involved the determination of time of paralysis and time of death of the worms. The leaves extracts of *A. paniculata* which contains the various phytoconstituents such as tannins, flavonoids, alkaloids etc. Both the extracts exhibited significant anti-helmintic activity in a dose dependent manner. In present investigations confirms that the leaves extracts of *A. paniculata* contains various phytoconstituents and this leaves which contains the anthelmintic activity against the *Pheretima posthuma*.

Keywords: Anthelmintic activity, *Andrographis paniculata, Pheretima posthuma,* tannins.

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INTRODUCTION

Helminthiasis is a major problem in the tropical regions especially in Asian countries. In worldwide nearly two billions of peoples were affected by helminthiasis. It affects both the humans and animals in the developing countries [1]. Nearly 300 million peoples were severely affected by the parasites. *Pheretima posthuma* is the most common intestinal round worm, which causes the severe infections in both the humans and animals [2]. The parasites which causes the various infections with a clinical symptoms of diarrhea, nausea, anaemia, vomiting etc [2]. Helminthic infections retard the immune responses against the pathogens. The large number of chemically anthelmintic agents are available, but it causes some side effects. There is a growing interest in herbal medicines because of their efficiency and negligible side effects.

Andrographis paniculata is an important plant in the Acanthacea family. It is commonly called as king of bitter. It is highly distributed in Asian countries especially in India. In this plant is highly used in ayurvedic formulations. It mainly used to overcome skin diseases, fever, ulcer and burning sensation [3]. The various parts of this plants which contains the various chemicals like flavonoids, phenols, coumarin, tannin etc. These compounds may be responsible for the various pharmacological activity of this plant. Hence the present study aims to investigates the phyotchemical constituents and find the anthelmintic activity of various extracts of *A. paniculata.*

MATERIALS AND METHOD

Collection of plant materials and preparation of extracts:

The fresh leaves of *A. paniculata* were collected locally and authenticated by the department of Botany, St. Joseph College, Trichy. Dried leaves were powdered mechanically and stored in air tight container. The extraction was carried out by hot percolation method using soxhlet apparatus. Various solvents such as water and acetone was used. Then 300 gm of coarse powder was extracted with 900 ml of extra acetone successively in a Soxhlet extractor repeatedly for 48 hours. The extract was dried by solvent evaporation in a thermostat water bath at 50-60 ^{0}C temperature.

Another 300 gm coarse powder was macerated with 900 ml of distilled water for 48 hours. After completion of 48 hours it is filtered to separate the water extract from the marc. The extract was concentrated in a thermostat water bath at 70-80 ^{0}C temperature and all the extracts were kept in dessicator for the experiment [4].

Phytochemical Screening

For preliminary phytochemical analysis the freshly prepared crude various extracts of leaves were tested for the presence or absence of phytoconstituents such as reducing sugar, tannins, flavonoids, steroids and alkaloids by using standard phytochemical procedures [5].

Invitro Antihelminthic Activity

Indian adult earth worms *P. posthuma* were used to carry out the antihelminthic evaluation. The earth worms were collected from the moist soil of the medicinal garden. Worms were washed with saline water to remove the faecal matter. Worms of about 11 cm length and 0.3 to 0.4 cm width were selected for the experiment. The extracts were used at different concentrations of 10, 50, and 100 mg/ml. All the test solution and standard drug solution were prepared freshly before starting the experiments. Time for paralysis was noted when no movement of any sort could be observed except the worms were shaken vigourously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigourously nor when dipped in warm water at 50^0C [6].

RESULTS AND DISCUSSION

The preliminary phytochemical screening tests for the methanol extract of *A. paniculata* leaves (Table 1) revealed the presence of alkaloids, terpenoids, steroids, coumarins, tannins, flavonoids, phenols, volatile oils, quinine and saponin. Any of these secondary metabolites, singly or in combination with others could be responsible for the anthelmintic activity of the plant.

The preliminary phytochemical analysis was carried out in the leaf extracts of *A. paniculata*. The phytochemical analysis was carried out in the three different extract. The water extract of plant contain more compound than compared to other solvents. The water extract of *A. paniculata* showed on indication of the presence of coumarin, flavonoids, tannin, phenolic compound and alkaloids were confirmed in suitable test. The acetone extract of plant contain coumarin, flavonoids, tannin and alkaloids. Many of the plant leaves which contains the flavonids, tannins and alkaloids. These compounds are the responsible for its pharmacological activity.

Table1: Phytochemical analysis of *A. paniculata* leaves of various extracts

S.no	Test	Water extract	Acetone extract
1	Alkaloids	+	+
2	Terpenoids	+	+
3	Steroids	-	-
4	Coumarins	+	+
5	Tannins	+	+
6	Flavonoids	+	+
7	Phenols	+	-
8	Volatile Oil	-	-

9	Quinone	-	-
10	Saponin	+	-

Table 2 shows the results of antihelminthic activity of *A. paniculata.* In the present study all the three extracts which contains the antihelminthic activity against the *Pheretima posthuma.* The concentration of 10, 50, 100 mg/ml concentration which have the antihelminthic activity. The crude extracts of the leaves of *A. calamus* have a significant antihelminthic activity on *Pheretima posthuma* in a dose dependent manner[7]. The water extract demonstrated paralysis as well as death of worms in a less time compared to other extract especially at higher concentration of 100 mg/ml.

Table: 2: Antihelmintic activity of leaves of *A. paniculata*

Extracts	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Aqueous extract	10	80	93
	50	93	96
	100	97	96
Acetone extract	10	80	83
	50	95	97
	100	97	99

Helminthes is a major problem to livestock production throughout the tropical regions. Parasitic helminthes affect the human being and animals by causing considerable hardship and stunted growth. The traditional medicines have prominent source of effective antihelmintic agents to the peoples particularly in developing countries. Athnasiadou et al (2001) was reported that the tannin compounds in the plant extracts which have the antihelminthic activity. Tannin compounds are binds the free proteins in the gastrointestinal tract of host animal and it causes the parasitic death. In our study the plant extracts which contains the tannin, it may be the reason for its antihelminthic effect.

CONCLUSION

From the above preliminary study, we conclude that the aqueous extract of *A.paniculata* proved to be one of the herbal remedies for helminthic infections. The *A.paniculata* leaves is more suitable herbal powder to inhibit the decaying organisms. So that it can be used as a potential source for the development of a phytomedicine to act against helminthic infections.

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