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COMPARATIVE STUDIES ON ANTHELMINTIC ACTIVITY OF LEAF EXTRACT OF *MUSA ACUMINATE* COLLA AND *CAJANUS CAJAN* (LINN.) LEAF EXTRACT

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ABSTRACT

Methanolic extract of leaf of Musa acuminate colla and seed of Cajanus cajan (Linn.) were taken for the examination of anthelmintic activity on Indian earthworm (Pheretima posthuma). Various concentrations (10mg/ml, 20mg/ml, 30 mg/ml) of both plant extract were tested and results were expressed in terms of time of paralysis and time of death of worms. Albendazole of same concentration as like as plant extracts was taken as reference standard and normal saline solution as control. Paralysis time can be determined by vigorous shaking when no movement was observed. When whitish substances were secreted from the body that one was termed as death time. Both the extracts show significant anthelmintic activity but among these two Musa acuminate colla showed more anthelmintic activity than Cajanus cajan (Linn.). Future scope involves isolation of active constituents responsible for this action.

Key words: Anthelmintic activity, Musa acuminate colla, Cajanus cajan (Linn.), Pheretima posthuma, Vermifuge, Vermicidal.

INTRODUCTION

The World Health Organization estimates that a staggering two billon people harbor parasitic worm infections (Kumar *et al*., 2010). Helminthiasis is still one among the most important human and animal diseases (Lateef *et al*., 2003). 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 helminthes and several the indiscriminate use of some drugs are generated several cases of resistance. As an important component of complementary and alternative medicine, traditional Ayurvedic medicinal plants may be useful to discovery and development of new chemical substance for helminthes control which are generally considered to be very important sources of bioactive substances (Deore *et al*., 2010). Anthelmintic that are obtained from the natural resources may play an important role in the treatment of worm infection with less side effects (Aswar *et al*., 2008).

The Tribal as well as non-tribal peoples of Tripura traditionally use these two plants against helminthiasis. The aim of the present study is to evaluate the in vitro anthelmintic activity of *Musa acuminate* colla and *Cajanus cajan* (Linn.) leaf and seed extract.

METERIALS AND METHODS

Plant material collection

Musa acuminate colla and *Cajanus cajan* (Linn.) was collected from south district of the state. The leaves of *Musa acuminate* colla and seeds of *Cajanus cajan* (Linn.) were washed with fresh water and dried under shade at room temperature. The leaves and seeds were powdered and stored. 60g of powdered drug was extracted separately with methanol by continuous hot percolation in soxlet apparatus and with water by cold maceration for 3 days respectively. The extracts were filtered and evaporated using a rotary evaporator. Dried extracts were stored at 20˚c until used (Mendhe *et al*., 2010).

Phytochemical screening

After the phytochemical study it was observed that dried leaf extract of *Musa acuminate* colla contains alkaloid, steroidal lactones, tannins and dried seed extract of *Cajanus cajan* (Linn.) contains subjected for the presence of different phytoconstituents like alkaloid, steroid, flavonoid, tannin, glycoside etc.

Selection of worms

Indian adult earthworms (*Pheretima posthuma*) were used to carry out the anthelmintic evaluation. The earthworms were collected from the moist soil of Durjaynagar, Agartala, Tripura (W). Worms were washed with saline water to remove the faecal matter. Worms were of about 11 cm length and 0.3 to 0.4 cm wide was selected for the experiment. Ready availability, anatomical and physiological resemblance of *Pheretima posthuma* made it to be used initially for in vitro evaluation of anthelmintic activity (Qureshi *et al*., 2010).

Drugs and chemicals

Albendazole suspension [Zentel (micronized albendazole), Glaxo Smithkline Pharmaceuticals Ltd., Bangalore] and Methanol [Loba chemie pvt. Ltd, Mumbai] and petroleum ether [Merck Ltd., Mumbai] were used during the experimental protocol.

Evaluation of anthelmintic activity

Anthelmintic activity was carried out on adult Indian earthworm *(Pheretima posthuma*) of nearly equal size, six in each group. Each extract was suspended in 1% w/v CMC (Carboxy Methyl Cellulose) solution prepared in distilled water to obtain concentration of 10, 20, and 30 mg/ml. Reference standard albendazole suspension (30 mg/ml) was diluted by the same suspending agent to obtain concentration of 20 and 10 mg/ml. Worms were placed in petridishes containing 15 ml of sample solution. Time for paralysis was noted either when any movement could not be observed except when the worms were shaken vigorously or when dipped in warm water (50˚c) (Dey *et al*., 2012). Death was included when the worms lost their motility followed with white secretion and fading away of their body colours (Karale *et al*., 2010).

RESULTS AND DISCUSSION

Both the plant extracts showed significant anthelmintic activity at all tested doses when compared to reference standard (table 1) as vermifuge and vermicide Potency of the extract was inversely proportional to time for paralysis and death of worms. MLE of *Musa acuminate* colla at 30 mg/ml concentration shows paralysis at 45.43 min and death at 129.83 min, whereas MSE of *Cajanus cajan* (Linn.) shows paralysis at 56.19 min and death at 151.63 min respectively against the earthworm *Pheretima posthuma*. The reference drug albendazole exhibit the same at 2.33 min and 10.83 min respectively. Albendazole exhibits anthelmintic activity by blocking glucose uptake and depletion of glycogen stores in test parasite. So, MLE is more active than MSE. The primary phytochemical screening revealed the presence of alkaloids, and tannins both the plant extract. All the extracts showed the anthelmintic activity; probably these are responsible for

anthelmintic activity. Further study is under progress to isolate the pure component fraction.

Table 1: Anthelmintic Activity of MLE, PLE, ALE of leaf extract of *Musa acuminate* colla and seed extract of *Cajanus cajan* (Linn.).

Sl no.	Groups	Concentration (mg/ml)	Time(min) Paralysis	Death
1.	Control	-	-	-
2.	Standard (Albendazole)	10	4.43 ± 0.22	25.13 ± 0.28
		20	3.25 ± 0.16	12.93 ± 0.58
		30	2.33 ± 0.21	10.83 ± 0.47
3.	MLE of *Musa acuminate* colla	10	66.13 ± 0.9838	155.06 ± 0.4631
		20	55.63 ± 0.3844	144.79 ± 0.7955
		30	45.43 ± 0.6766	129.83 ± 0.9387
4.	MSE of *Cajanus cajan* (Linn.)	10	79.66 ± 0.8673	175.23 ± 0.6888
		20	67.61 ± 0.4219	162.06 ± 0.8353
		30	56.19 ± 0.6504	151.63 ± 0.9361

Values are expressed a mean ± SEM, n=6, MLE: methanol leaf extract; MSE: methanol seed extract

CONCLUSION

Finally, it can be concluded that all extracts of leaves and seeds shows significant anthelmintic activity. Further study can de continued for in vivo evaluation of some species other than *Pheretima posthuma* followed by isolation and characterization of the particular chemical moiety for the activity.

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